

10/522106

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Sequence Listing
SEQUENCE LISTING

<110> Kogel, Karl-Heinz
Huckelhoven, Ralph
Trujillo, Marco

<120> Method for Obtaining a Pathogen Resistance in Plants

<130> 532622010500

<140> To be assigned
<141> 2005-01-24

<160> 24

<170> PatentIn Ver. 2.1

<210> 1

<211> 337

<212> DNA

<213> Hordeum vulgare

<220>

<221> CDS

<222> (2)..(337)

<223> coding for NADPH oxidase (fragment)

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Phe Lys Gly Ile Met Asn Glu Ile Ala Glu Leu Asp Gln Arg Asn Ile
1 5 10 15

att gag atg cac aac tat ctc aca agt gtt tat gag gaa ggg gat gct 97
Ile Glu Met His Asn Tyr Leu Thr Ser Val Tyr Glu Glu Gly Asp Ala
20 25 30

cgg tca gca ctc atc aca atg ctg caa gct ctc aac cat gcc aag aat 145
Arg Ser Ala Leu Ile Thr Met Leu Gln Ala Leu Asn His Ala Lys Asn
35 40 45

ggt gtc gat gta gtg tct ggm act cga gtc cg 193
Gly Val Asp Val Val Ser Xaa Thr Arg Val Arg Thr His Phe Ala Arg
50 55 60

cca aat ttt aag agg gtg ctg tct aag gta gcc gcc aaa cat cct tat 241
Pro Asn Phe Lys Arg Val Leu Ser Lys Val Ala Ala Lys His Pro Tyr
65 70 75 80

gcc aag ata gga gtg ttc tat tgc gga gct cca gtt ctg gcg cag gaa 289
Ala Lys Ile Gly Val Phe Tyr Cys Gly Ala Pro Val Leu Ala Gln Glu
85 90 95

cta agc aac ctt tgc cat gag ttc aat ggc aaa tgc acg aca aaa ttc 337
Leu Ser Asn Leu Cys His Glu Phe Asn Gln Lys Cys Thr Thr Lys Phe
100 105 110

<210> 2

<211> 112

<212> PRT

<213> Hordeum vulgare

<400> 2

Phe Lys Gly Ile Met Asn Glu Ile Ala Glu Leu Asp Gln Arg Asn Ile
1 5 10 15

Ile Glu Met His Asn Tyr Leu Thr Ser Val Tyr Glu Glu Gly Asp Ala
20 25 30

Arg Ser Ala Leu Ile Thr Met Leu Gln Ala Leu Asn His Ala Lys Asn
35 40 45

Gly Val Asp Val Val Ser Xaa Thr Arg Val Arg Thr His Phe Ala Arg
50 55 60

Pro Asn Phe Lys Arg Val Leu Ser Lys Val Ala Ala Lys His Pro Tyr
65 70 75 80

Ala Lys Ile Gly Val Phe Tyr Cys Gly Ala Pro Val Leu Ala Gln Glu
85 90 95

Leu Ser Asn Leu Cys His Glu Phe Asn Gln Lys Cys Thr Thr Lys Phe
100 105 110

Sequence Listing

<210> 3

<211> 2832

<212> DNA

<213> Oryza sativa

<220>

<221> CDS

<222> (1)..(2829)

<223> coding for NADPH oxidase

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acg	aca	ccg	ccg	tcg	ctg	agc	acg	ggc	tcg	tcg	ccg	cgc	ggg	tcc	gac		96
Thr	Thr	Pro	Arg	Ser	Leu	Ser	Thr	Gly	Ser	Ser	Pro	Arg	Gly	Ser	Asp		
20	25									30							
gac	cg	agc	tcc	gac	gac	ggg	gag	ctg	gtc	gag	gtc	acg	ctc	gac		144	
Asp	Arg	Ser	Ser	Asp	Asp	Gly	Glu	Glu	Leu	Val	Glu	Val	Thr	Leu	Asp		
35	40									45							
ctg	cag	gac	gac	gac	acc	att	gtg	ctt	cg	agc	gtc	gag	ccc	g	gcg		192
Leu	Gln	Asp	Asp	Asp	Thr	Ile	Val	Leu	Arg	Ser	Val	Glu	Pro	Ala	Ala		
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g	cg	g	cg	g	gg	gt	gg	g	cg	gg	g	cg	tcg	g	cg		240
Ala	Ala	Ala	Ala	Gly	Val	Gly	Ala	Gly	Ala	Gly	Ala	Ala	Ser	Ala	Arg		
65	70									75					80		
gg	g	g	ct	ac	gg	gg	cc	tc	tc	tc	tc	cg	tcg	agg	tcg		288
Gly	Glu	Leu	Thr	Gly	Gly	Pro	Ser	Ser	Ser	Ser	Ser	Arg	Ser	Arg	Ser		
85	90									95							
cc	tc	at	cg	gg	ag	ag	tc	tc	ca	cg	ct	tc	ca	tt	tc		336
Pro	Ser	Ile	Arg	Arg	Ser	Ser	Ser	His	Arg	Leu	Leu	Gln	Phe	Ser	Gln		
100	105									110							
g	ag	ct	aag	g	cg	g	gg	at	g	cc	cg	cg	ca	tc	g		384
Glu	Leu	Lys	Ala	Glu	Ala	Met	Ala	Arg	Ala	Arg	Gln	Phe	Ser	Gln	Asp		
115	120									125							
ct	g	ac	aag	cg	tt	gg	cg	cg	ag	ca	gaa	g	cg	ca	g		432
Leu	Thr	Lys	Arg	Phe	Gly	Arg	Ser	His	Ser	Arg	Ser	Glu	Ala	Gln	Ala		
130	135									140							
cc	tc	gg	ct	g	ag	tt	cc	gg	cc	cg	cg	cg	cg	ca		480	
Pro	Ser	Gly	Leu	Glu	Ser	Ala	Leu	Ala	Ala	Arg	Ala	Ala	Arg	Arg	Gln		
145	150									155					160		
cg	gc	c	tg	ct	g	ac	cg	tc	gg	cc	ca	aag	g	cg	ct		528
Arg	Ala	Gln	Leu	Asp	Arg	Thr	Arg	Ser	Gly	Ala	His	Lys	Ala	Leu	Arg		
165	170									175							
gg	ct	cg	tt	at	ag	ag	aa	gg	aa	aa	gg	tgg	atg	g		576	
Gly	Leu	Arg	Phe	Ile	Ser	Ser	Asn	Lys	Ala	Asn	Asn	Ala	Trp	Met	Glu		
180	185									190							
gt	ca	g	cc	aa	tt	ca	cg	cc	ga	gg	ta	ct	tcc	tc	cg		624
Val	Gln	Ala	Asn	Phe	Asp	Arg	Leu	Ala	Arg	Asp	Gly	Tyr	Leu	Ser	Arg		
195	200									205							
tcc	gac	ttc	gg	gaa	tgc	atc	gg	atg	ac	gaa	tcg	aag	g	gg	tt		672
Ser	Asp	Phe	Ala	Glu	Cys	Ile	Gly	Met	Thr	Glu	Ser	Lys	Glu	Phe	Ala		
210	215									220							
ctc	gag	ct	ttc	ga	ac	ct	gg	cg	ca	cg	atg	aag	gt	g		720	
Leu	Glu	Leu	Phe	Asp	Thr	Leu	Ser	Arg	Arg	Arg	Gln	Met	Lys	Val	Asp		
225	230									235					240		
ac	tt	aa	ag	at	gaa	ctc	cg	gag	atc	tgg	cag	cag	atc	acc	gat		768
Thr	Ile	Asn	Lys	Asp	Glu	Leu	Arg	Glu	Ile	Trp	Gln	Gln	Ile	Thr	Asp		
245	250									255							
aac	agc	ttc	ga	tc	cgt	ctc	caa	atc	ttc	gaa	atg	gt	gat	aag		816	
Asn	Ser	Phe	Asp	Ser	Arg	Leu	Gln	Ile	Phe	Phe	Glu	Met	Val	Asp	Lys		
260	265									270							
aac	g	cg	g	gc	cg	at	ac	g	g	gt	aaa	gag	at	at	atg		864
Asn	Ala	Asp	Gly	Arg	Ile	Thr	Glu	Ala	Glu	Val	Lys	Glu	Ile	Ile	Met		

Sequence Listing

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ttg agc gcg tct gcc aat aaa	ctg tcg agg ctt aag gag	caa gca gaa	912
Leu Ser Ala Ser Ala Asn Lys	Leu Ser Arg Leu Lys	Glu Gln Ala Glu	
290	295	300	
gag tac gcc gct ttg atc atg gag gag	ctt gat cct gaa ggg	ctc ggc	960
Glu Tyr Ala Ala Leu Ile Met Glu Glu	Leu Asp Pro Glu Gly	Leu Gly	
305	310	315	320
tac att gag cta tgg caa ttg gag aca	ctt ctg ttg cag aaa	gat acc	1008
Tyr Ile Glu Leu Trp Gln Leu Glu Thr	Leu Leu Leu Gln Lys	Asp Thr	
325	330	335	
tat atg aac tat agt cag gcc ctt agt	tac aca agc caa	gca ctg agc	1056
Tyr Met Asn Tyr Ser Gln Ala Leu Ser	Tyr Thr Ser Gln Ala Leu Ser		
340	345	350	
cag aat ctt gca ggg cta agg aag aag	agt tca atc cgc aaa	ata agc	1104
Gln Asn Leu Ala Gly Leu Arg Lys Lys	Ser Ser Ile Arg Lys Ile Ser		
355	360	365	
acc tct tta agc tac tat ttc gag gac	aac tgg aaa cgt tta tgg gtg		1152
Thr Ser Leu Ser Tyr Tyr Phe Glu Asp	Asn Trp Lys Arg Leu Trp Val		
370	375	380	
ctt gca ttg tgg att ggg ata atg gct	gga ctg ttc acc tgg aaa ttc		1200
Leu Ala Leu Trp Ile Gly Ile Met Ala	Gly Leu Phe Thr Trp Lys Phe		
385	390	395	400
atg cag tat cgt aac cga tat gtc ttt	gat gtg atg ggc tac tgt gtc		1248
Met Gln Tyr Arg Asn Arg Tyr Val Phe	Asp Val Met Gly Tyr Cys Val		
405	410	415	
aca aca gca aaa gga gct gct gaa acc	cta aag ctg aat atg gca att		1296
Thr Thr Ala Lys Gly Ala Ala Glu	Thr Leu Lys Leu Asn Met Ala Ile		
420	425	430	
atc ctc ctc cca gta tgc cgt aac acc	att act tgg ttg cga agt aca		1344
Ile Leu Leu Pro Val Cys Arg Asn Thr	Ile Thr Trp Leu Arg Ser Thr		
435	440	445	
agg gct gca cg gca cta cct ttt gat	gac aac atc aac ttc cac aag		1392
Arg Ala Ala Arg Ala Leu Pro Phe Asp	Asp Asn Ile Asn Phe His Lys		
450	455	460	
act att gca gca gca att gtg gtt ggt	ata atc ctc cat gca ggg aac		1440
Thr Ile Ala Ala Ala Ile Val Val Gly	Ile Ile Leu His Ala Gly Asn		
465	470	475	480
cac ctt gta tgc gat ttt cca cg gta	ata aaa tca tca gat gag aag		1488
His Leu Val Cys Asp Phe Pro Arg Leu	Ile Lys Ser Ser Asp Glu Lys		
485	490	495	
tat gct cct ttg ggc cag tat ttt ggg	gaa ata aag cca aca tat ttt		1536
Tyr Ala Pro Leu Gly Gln Tyr Phe	Gly Glu Ile Lys Pro Thr Tyr Phe		
500	505	510	
aca ttg gtc aaa gga gtg gag ggc	atc act ggg gta atc atg gtt gta		1584
Thr Leu Val Lys Gly Val Glu Gly	Ile Thr Gly Val Ile Met Val Val		
515	520	525	
tgc atg ata att gct ttt act cta gca	acc cg gtt ttc cgc cgt agc		1632
Cys Met Ile Ile Ala Phe Thr Leu Ala	Thr Arg Trp Phe Arg Arg Ser		
530	535	540	
ttg gtt aag ctt cca agg cca ttt gac	aaa ctg act ggc ttc aat gcc		1680
Leu Val Lys Leu Pro Arg Pro Phe Asp	Lys Leu Thr Gly Phe Asn Ala		
545	550	555	560
ttt tgg tat tct cat cat ctg ttc atc	att gtg tat atc gcg ctc att		1728
Phe Trp Tyr Ser His His Leu Phe Ile	Ile Val Tyr Ile Ala Leu Ile		
565	570	575	
gtt cat gga gag tgt cta tac ctt att	cat gtc tgg tac aga aga acg		1776
Val His Gly Glu Cys Leu Tyr Leu	Ile His Val Trp Tyr Arg Arg Thr		
580	585	590	
aca tgg atg tat ctt tca gtg cct gtt	tgc ttg tat gta ggg gag agg		1824
Thr Trp Met Tyr Leu Ser Val Pro Val	Cys Leu Tyr Val Gly Glu Arg		
595	600	605	
att cta agg ttc ttc agg tct ggc agt	tat tct gtc cgg cta ttg aag		1872
Ile Leu Arg Phe Phe Arg Ser Gly Ser	Tyr Ser Val Arg Leu Leu Lys		

Sequence Listing

610	615	620	
gtg gcc ata tat cca ggt aat gtt ttg aca ctg caa atg tcc aag cct			1920
Val Ala Ile Tyr Pro Gly Asn Val Leu Thr Leu Gln Met Ser Lys Pro			
625	630	635	640
ccc acg ttc cgt tac aag agt gga caa tat atg ttt gtt caa tgt cca			1968
Pro Thr Phe Arg Tyr Lys Ser Gly Gln Tyr Met Phe Val Gln Cys Pro			
645	650	655	
gca gtg tct ccc ttt gaa tgg cat ccc ttc tca att act tca gca cct			2016
Ala Val Ser Pro Phe Glu Trp His Pro Phe Ser Ile Thr Ser Ala Pro			
660	665	670	
ggg gat gac tac ctc agc att cat gtt cga caa ctt ggt gat tgg aca			2064
Gly Asp Asp Tyr Leu Ser Ile His Val Arg Gln Leu Gly Asp Trp Thr			
675	680	685	
cga gaa ctc aag aga gta ttt gct gca gct ttt gag ccc cca gcg ggt			2112
Arg Glu Leu Lys Arg Val Phe Ala Ala Ala Cys Glu Pro Pro Ala Gly			
690	695	700	
ggt aaa agc ggc ctt ctt agg gca gat gag aca act aag aaa atc tta			2160
Gly Lys Ser Gly Leu Leu Arg Ala Asp Glu Thr Thr Lys Lys Ile Leu			
705	710	715	720
ccc aag ctt ctg att gat gga ccg tat ggt tct cct gct cag gat tac			2208
Pro Lys Leu Leu Ile Asp Gly Pro Tyr Gly Ser Pro Ala Gln Asp Tyr			
725	730	735	
agc aag tat gat gtt tta tta ctt gtt gga tta gga att ggt gcg aca			2256
Ser Lys Tyr Asp Val Leu Leu Leu Val Gly Leu Gly Ile Gly Ala Thr			
740	745	750	
ccc ttt att agc ata tta aaa gat ctt ctg aat aac atc atc aaa atg			2304
Pro Phe Ile Ser Ile Leu Lys Asp Leu Leu Asn Asn Ile Ile Lys Met			
755	760	765	
gag gaa gag gag gat gct tct act gat ctt tat cca cca atg ggt cgg			2352
Glu Glu Glu Asp Ala Ser Thr Asp Leu Tyr Pro Pro Met Gly Arg			
770	775	780	
aat aag cca cat gtt gat ctg ggc aca ctt atg acg att acc tca aga			2400
Asn Lys Pro His Val Asp Leu Gly Thr Leu Met Thr Ile Thr Ser Arg			
785	790	795	800
cca aag aag atc ttg aag acc aca aat gct tac ttt tac tgg gtg aca			2448
Pro Lys Lys Ile Leu Lys Thr Thr Asn Ala Tyr Phe Tyr Trp Val Thr			
805	810	815	
cgt gag caa ggc tct ttt gat tgg ttc aaa gga gtc atg aat gaa att			2496
Arg Glu Gln Gly Ser Phe Asp Trp Phe Lys Gly Val Met Asn Glu Ile			
820	825	830	
gct gac ttg gat caa agg aat atc att gag atg cac aac tac cta aca			2544
Ala Asp Leu Asp Gln Arg Asn Ile Ile Glu Met His Asn Tyr Leu Thr			
835	840	845	
agc gtc tat gag gag ggg gat gcc agg tca gca ctc atc acc atg ctc			2592
Ser Val Tyr Glu Glu Gly Asp Ala Arg Ser Ala Leu Ile Thr Met Leu			
850	855	860	
caa gct ctg aac cat gcc aag aat gga gtt gat att gtc tct ggg aca			2640
Gln Ala Leu Asn His Ala Lys Asn Gly Val Asp Ile Val Ser Gly Thr			
865	870	875	880
aaa gtc cg ^g aca cat ttt gca cga cca aat tgg aga aag gtc ctt tct			2688
Lys Val Arg Thr His Phe Ala Arg Pro Asn Trp Arg Lys Val Leu Ser			
885	890	895	
aaa att tcc tcc aag cat cca tat gcc aaa ata ggt gta ttc tac tgt			2736
Lys Ile Ser Ser Lys His Pro Tyr Ala Lys Ile Gly Val Phe Tyr Cys			
900	905	910	
gga gct cca gtc ctg gca caa gaa cta agc aaa ctt tgc cat gaa ttc			2784
Gly Ala Pro Val Leu Ala Gln Glu Leu Ser Lys Leu Cys His Glu Phe			
915	920	925	
aac ggg aaa tgc aca acg aag ttc gaa ttc cat aag gag cat ttc tga			2832
Asn Gly Lys Cys Thr Thr Lys Phe Glu Phe His Lys Glu His Phe			
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<210> 4
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Sequence Listing

<212> PRT

<213> Oryza sativa

<400> 4

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35 40 45
Leu Gln Asp Asp Asp Thr Ile Val Leu Arg Ser Val Glu Pro Ala Ala
50 55 60
Ala Ala Ala Ala Gly Val Gly Ala Gly Ala Ala Ser Ala Arg
65 70 75 80
Gly Glu Leu Thr Gly Gly Pro Ser Ser Ser Ser Arg Ser Arg Ser
85 90 95
Pro Ser Ile Arg Arg Ser Ser His Arg Leu Leu Gln Phe Ser Gln
100 105 110
Glu Leu Lys Ala Glu Ala Met Ala Arg Ala Arg Gln Phe Ser Gln Asp
115 120 125
Leu Thr Lys Arg Phe Gly Arg Ser His Ser Arg Ser Glu Ala Gln Ala
130 135 140
Pro Ser Gly Leu Glu Ser Ala Leu Ala Ala Arg Ala Ala Arg Arg Gln
145 150 155 160
Arg Ala Gln Leu Asp Arg Thr Arg Ser Gly Ala His Lys Ala Leu Arg
165 170 175
Gly Leu Arg Phe Ile Ser Ser Asn Lys Ala Asn Asn Ala Trp Met Glu
180 185 190
val Gln Ala Asn Phe Asp Arg Leu Ala Arg Asp Gly Tyr Leu Ser Arg
195 200 205
Ser Asp Phe Ala Glu Cys Ile Gly Met Thr Glu Ser Lys Glu Phe Ala
210 215 220
Leu Glu Leu Phe Asp Thr Leu Ser Arg Arg Arg Gln Met Lys Val Asp
225 230 235 240
Thr Ile Asn Lys Asp Glu Leu Arg Glu Ile Trp Gln Gln Ile Thr Asp
245 250 255
Asn Ser Phe Asp Ser Arg Leu Gln Ile Phe Phe Glu Met Val Asp Lys
260 265 270
Asn Ala Asp Gly Arg Ile Thr Glu Ala Glu Val Lys Glu Ile Ile Met
275 280 285
Leu Ser Ala Ser Ala Asn Lys Leu Ser Arg Leu Lys Glu Gln Ala Glu
290 295 300
Glu Tyr Ala Ala Leu Ile Met Glu Glu Leu Asp Pro Glu Gly Leu Gly
305 310 315 320
Tyr Ile Glu Leu Trp Gln Leu Glu Thr Leu Leu Leu Gln Lys Asp Thr
325 330 335
Tyr Met Asn Tyr Ser Gln Ala Leu Ser Tyr Thr Ser Gln Ala Leu Ser
340 345 350
Gln Asn Leu Ala Gly Leu Arg Lys Lys Ser Ser Ile Arg Lys Ile Ser
355 360 365
Thr Ser Leu Ser Tyr Tyr Phe Glu Asp Asn Trp Lys Arg Leu Trp Val
370 375 380
Leu Ala Leu Trp Ile Gly Ile Met Ala Gly Leu Phe Thr Trp Lys Phe
385 390 395 400
Met Gln Tyr Arg Asn Arg Tyr Val Phe Asp Val Met Gly Tyr Cys Val
405 410 415
Thr Thr Ala Lys Gly Ala Ala Glu Thr Leu Lys Leu Asn Met Ala Ile
420 425 430
Ile Leu Leu Pro Val Cys Arg Asn Thr Ile Thr Trp Leu Arg Ser Thr
435 440 445
Arg Ala Ala Arg Ala Leu Pro Phe Asp Asp Asn Ile Asn Phe His Lys
450 455 460
Thr Ile Ala Ala Ala Ile Val Val Gly Ile Ile Leu His Ala Gly Asn
465 470 475 480

Sequence Listing

His	Leu	Val	Cys	Asp	Phe	Pro	Arg	Leu	Ile	Lys	Ser	Ser	Asp	Glu	Lys
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					500					505					510
Thr	Leu	Val	Lys	Gly	Val	Glu	Gly	Ile	Thr	Gly	Val	Ile	Met	Val	Val
					515					520					525
Cys	Met	Ile	Ile	Ala	Phe	Thr	Leu	Ala	Thr	Arg	Trp	Phe	Arg	Arg	Ser
					530					535					540
Leu	Val	Lys	Leu	Pro	Arg	Pro	Phe	Asp	Lys	Leu	Thr	Gly	Phe	Asn	Ala
					545					550					560
Phe	Trp	Tyr	Ser	His	His	Leu	Phe	Ile	Ile	Val	Tyr	Ile	Ala	Leu	Ile
					565					570					575
Val	His	Gly	Glu	Cys	Leu	Tyr	Leu	Ile	His	Val	Trp	Tyr	Arg	Arg	Thr
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Thr	Trp	Met	Tyr	Leu	Ser	Val	Pro	Val	Cys	Leu	Tyr	Val	Gly	Glu	Arg
					595					600					605
Ile	Leu	Arg	Phe	Phe	Arg	Ser	Gly	Ser	Tyr	Ser	Val	Arg	Leu	Leu	Lys
					610					615					620
Val	Ala	Ile	Tyr	Pro	Gly	Asn	Val	Leu	Thr	Leu	Gln	Met	Ser	Lys	Pro
					625					630					640
Pro	Thr	Phe	Arg	Tyr	Lys	Ser	Gly	Gln	Tyr	Met	Phe	Val	Gln	Cys	Pro
					645					650					655
Ala	Val	Ser	Pro	Phe	Glu	Trp	His	Pro	Phe	Ser	Ile	Thr	Ser	Ala	Pro
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Gly	Asp	Asp	Tyr	Leu	Ser	Ile	His	Val	Arg	Gln	Leu	Gly	Asp	Trp	Thr
					675					680					685
Arg	Glu	Leu	Lys	Arg	Val	Phe	Ala	Ala	Ala	Cys	Glu	Pro	Pro	Ala	Gly
					690					695					700
Gly	Lys	Ser	Gly	Leu	Leu	Arg	Ala	Asp	Glu	Thr	Thr	Lys	Lys	Ile	Leu
					705					710					720
Pro	Lys	Leu	Leu	Ile	Asp	Gly	Pro	Tyr	Gly	Ser	Pro	Ala	Gln	Asp	Tyr
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Ser	Lys	Tyr	Asp	Val	Leu	Leu	Leu	Val	Gly	Leu	Gly	Ile	Gly	Ala	Thr
					740					745					750
Pro	Phe	Ile	Ser	Ile	Leu	Lys	Asp	Leu	Leu	Asn	Asn	Ile	Ile	Lys	Met
					755					760					765
Glu	Glu	Glu	Glu	Asp	Ala	Ser	Thr	Asp	Leu	Tyr	Pro	Pro	Met	Gly	Arg
					770					775					780
Asn	Lys	Pro	His	Val	Asp	Leu	Gly	Thr	Leu	Met	Thr	Ile	Thr	Ser	Arg
					785					790					800
Pro	Lys	Lys	Ile	Leu	Lys	Thr	Thr	Asn	Ala	Tyr	Phe	Tyr	Trp	Val	Thr
					805					810					815
Arg	Glu	Gln	Gly	Ser	Phe	Asp	Trp	Phe	Lys	Gly	Val	Met	Asn	Glu	Ile
					820					825					830
Ala	Asp	Leu	Asp	Gln	Arg	Asn	Ile	Ile	Glu	Met	His	Asn	Tyr	Leu	Thr
					835					840					845
Ser	Val	Tyr	Glu	Glu	Gly	Asp	Ala	Arg	Ser	Ala	Leu	Ile	Thr	Met	Leu
					850					855					860
Gln	Ala	Leu	Asn	His	Ala	Lys	Asn	Gly	Val	Asp	Ile	val	Ser	Gly	Thr
					865					870					880
Lys	Val	Arg	Thr	His	Phe	Ala	Arg	Pro	Asn	Trp	Arg	Lys	Val	Leu	Ser
					885					890					895
Lys	Ile	Ser	Ser	Lys	His	Pro	Tyr	Ala	Lys	Ile	Gly	Val	Phe	Tyr	Cys
					900					905					910
Gly	Ala	Pro	Val	Leu	Ala	Gln	Glu	Leu	Ser	Lys	Leu	Cys	His	Glu	Phe
					915					920					925
Asn	Gly	Lys	Cys	Thr	Thr	Lys	Phe	Glu	Phe	His	Lys	Glu	His	Phe	
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<210> 5

<211> 2889

<212> DNA

<213> Nicotiana tabacum

Sequence Listing

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<221> CDS
<222> (1)..(2886)
<223> coding for NADPH oxidase
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tct tcc gac aag gat ttt agt ggt gaa tta tcg ccg gga gct gat tcc 96
Ser Ser Asp Lys Asp Phe Ser Gly Glu Leu Ser Pro Gly Ala Asp Ser
    20          25          30
ggc tat aat tcc ggt ttt gct tcc gag gag ttt gtt gaa gtc acg ctt 144
Gly Tyr Asn Ser Gly Phe Ala Ser Glu Glu Phe Val Glu Val Thr Leu
    35          40          45
gat ctt cag gat gat gat acc att att cta cgg agc gtt gaa ccg gct 192
Asp Leu Gln Asp Asp Asp Thr Ile Ile Leu Arg Ser Val Glu Pro Ala
    50          55          60
act gtg att aac att gac gct cct gat ctt ccc gcc gga gtc ggt att 240
Thr Val Ile Asn Ile Asp Ala Pro Asp Leu Pro Ala Gly Val Gly Ile
    65          70          75          80
tcc gga gtt tca att gaa act ccg acg tca gca tcg gtg tcg gaa tct 288
Ser Gly Val Ser Ile Glu Thr Pro Thr Ser Ala Ser Val Ser Glu Ser
    85          90          95
cga tcg ccg acg atc cgc cgg agt tca tct agt aaa ctt cgt cag ttt 336
Arg Ser Pro Thr Ile Arg Arg Ser Ser Ser Lys Leu Arg Gln Phe
    100         105         110
tca cag gag ttg aaa gct gag gcg gtt gcg aaa gcg agg cag ttt tca 384
Ser Gln Glu Leu Lys Ala Glu Ala Val Ala Lys Ala Arg Gln Phe Ser
    115         120         125
caa gag ctg aag gcg gag tta agg aga ttc tca tgg agc cat ggg cat 432
Gln Glu Leu Lys Ala Glu Leu Arg Arg Phe Ser Trp Ser His Gly His
    130         135         140
gcg tct cgc gcg ttt tcg ccc tcg tcg ttt ttt caa aac gcc gtc gtt 480
Ala Ser Arg Ala Phe Ser Pro Ser Ser Phe Phe Gln Asn Ala Val Val
    145         150         155         160
gga aca ggt aac gcg gtg gac tcg gct tta gcg gca cgt gca tta cgt 528
Gly Thr Gly Asn Gly Val Asp Ser Ala Leu Ala Ala Arg Ala Leu Arg
    165         170         175
cgg caa cgc gcg cag ctt gat cgg act cgt tcc agc gcc cat aga gct 576
Arg Gln Arg Ala Gln Leu Asp Arg Thr Arg Ser Ser Ala His Arg Ala
    180         185         190
ctt cgt aga ctc aaa ttc att agc aat aac aaa acc aat gga tgg aat 624
Leu Arg Arg Leu Lys Phe Ile Ser Asn Asn Lys Thr Asn Gly Trp Asn
    195         200         205
gaa gtt gaa aac aat ttc tca aag ctc gct aaa gac ggt tat ctt tac 672
Glu Val Glu Asn Asn Phe Ser Lys Leu Ala Lys Asp Gly Tyr Leu Tyr
    210         215         220
cgt tcc gat ttc gca caa tgc ata ggt atg aag gat tcg aag gaa ttt 720
Arg Ser Asp Phe Ala Gln Cys Ile Gly Met Lys Asp Ser Lys Glu Phe
    225         230         235         240
gca ttg gaa tta ttt gat gct ttg agt aga aga aga aga tta aag gtt 768
Ala Leu Glu Leu Phe Asp Ala Leu Ser Arg Arg Arg Arg Leu Lys Val
    245         250         255
gat aaa att agc aag gag gaa ttg tat gag tac tgg tct caa atc acc 816
Asp Lys Ile Ser Lys Glu Glu Leu Tyr Glu Tyr Trp Ser Gln Ile Thr
    260         265         270
gat cag agt ttc gat tct cgg ctt cag atc tcc ttc gac atg gtg gac 864
Asp Gln Ser Phe Asp Ser Arg Leu Gln Ile Ser Phe Asp Met Val Asp
    275         280         285
aag aat gaa gat ggt cga att gct gaa gag gaa gta aaa gag atc atc 912
Lys Asn Glu Asp Gly Arg Ile Ala Glu Glu Glu Val Lys Glu Ile Ile
    290         295         300
atg cta agt gca tct gca aac aag tta tca aga tta aaa gaa caa gca 960

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Sequence Listing

Met Leu Ser Ala Ser Ala Asn Lys Leu Ser Arg Leu Lys Glu Gln Ala		
305 310 315 320		
gag gag tat gca gct tta atc atg gaa gaa tta gat cct gaa aga aga ctc		1008
Glu Glu Tyr Ala Ala Leu Ile Met Glu Glu Leu Asp Pro Glu Arg Leu		
325 330 335		
ggc tac att gag cta tgg cag ctg gaa aca ctt ctc ctc caa aag gac		1056
Gly Tyr Ile Glu Leu Trp Gln Leu Glu Thr Leu Leu Gln Lys Asp		
340 345 350		
act tac ctc aac tac agt caa gca cta agt tac acg agc caa gcc ttg		1104
Thr Tyr Leu Asn Tyr Ser Gln Ala Leu Ser Tyr Thr Ser Gln Ala Leu		
355 360 365		
agc caa aac ctt cac gga tta agg aag aaa agc cca ata aaa aga atg		1152
Ser Gln Asn Leu His Gly Leu Arg Lys Lys Ser Pro Ile Lys Arg Met		
370 375 380		
agc aca aaa ctt gtc tat tca ttg caa gaa aac tgg aag aga att tgg		1200
Ser Thr Lys Leu Val Tyr Ser Leu Gln Glu Asn Trp Lys Arg Ile Trp		
385 390 395 400		
gtt ctc act tta tgg att ttg ata atg att ggg ctt ttt ctt tgg aag		1248
Val Leu Thr Leu Trp Ile Leu Ile Met Ile Gly Leu Phe Leu Trp Lys		
405 410 415		
tcc tat cag tac aaa aac aag agt gca ttc cgt gtc atg ggt tat tgc		1296
Phe Tyr Gln Tyr Lys Asn Lys Ser Ala Phe Arg Val Met Gly Tyr Cys		
420 425 430		
ctt gtc acg gct aag ggc gct gct gag act ctc aag ttc aac atg gct		1344
Leu Val Thr Ala Lys Gly Ala Ala Glu Thr Leu Lys Phe Asn Met Ala		
435 440 445		
ctt ata tta ttg cca gta tgc aga aac act att aca tgg ctc agg tcc		1392
Leu Ile Leu Leu Pro Val Cys Arg Asn Thr Ile Thr Trp Leu Arg Ser		
450 455 460		
acc aag ttg agc cat ttt gta ccc ttt gac gac aac atc aac ttt cac		1440
Thr Lys Leu Ser His Phe Val Pro Phe Asp Asp Asn Ile Asn Phe His		
465 470 475 480		
aag act gtc gct gca gcc att gtc act ggt atc ata ctc cat gct ggt		1488
Lys Thr Val Ala Ala Ala Ile Val Thr Gly Ile Ile Leu His Ala Gly		
485 490 495		
aac cat ctt gta tgt gat ttc cca agg ctt ata cat gca gat gat caa		1536
Asn His Leu Val Cys Asp Phe Pro Arg Leu Ile His Ala Asp Asp Gln		
500 505 510		
gat tat caa agt ttt ttg tcg aat gat ttt ggc caa agt aag cct gga		1584
Asp Tyr Gln Ser Phe Leu Ser Asn Asp Phe Gly Gln Ser Lys Pro Gly		
515 520 525		
tac ata gac ctt gtt aaa gga gtt gag ggt gtg acg gga ata ata atg		1632
Tyr Ile Asp Leu Val Lys Gly Val Glu Gly Val Thr Gly Ile Ile Met		
530 535 540		
gta atc ctt atg gcc att gct ttc act ctt gct aca cga tgg ttt aga		1680
Val Ile Leu Met Ala Ile Ala Phe Thr Leu Ala Thr Arg Trp Phe Arg		
545 550 555 560		
cgg agc ctc att aag ttg ccc aaa cct ttt gat aga ctc act ggc ttc		1728
Arg Ser Leu Ile Lys Leu Pro Lys Pro Phe Asp Arg Leu Thr Gly Phe		
565 570 575		
aat gca ttc tgg tat tca cac cac ctt gtc att gtc tac atc cta		1776
Asn Ala Phe Trp Tyr Ser His His Leu Leu Val Ile Val Tyr Ile Leu		
580 585 590		
ctg atc atc cat ggc acg ttc ctc ttc ctt gtg cat aaa tgg tac tcc		1824
Leu Ile Ile His Gly Thr Phe Leu Phe Leu Val His Lys Trp Tyr Ser		
595 600 605		
aag acg acg tgg atg tat cta gca gtt cct gtg ctt ctc tac gca ggg		1872
Lys Thr Thr Trp Met Tyr Leu Ala Val Pro Val Leu Leu Tyr Ala Gly		
610 615 620		
gaa aga act ctt aga ttc ttc cgg tca ggc ttg tac act gtc cgg ctt		1920
Glu Arg Thr Leu Arg Phe Phe Arg Ser Gly Leu Tyr Thr Val Arg Leu		
625 630 635 640		
ctg aaa gta gca ata tat cct gga aat gtc ctc act cta caa atg tct		1968

Sequence Listing

Leu Lys Val Ala Ile Tyr Pro Gly Asn Val Leu Thr Leu Gln Met Ser		
645 650 655		
aag cct cct caa ttt cga tac aaa agt gga caa tat atg ttt gtc cag	2016	
Lys Pro Pro Gln Phe Arg Tyr Lys Ser Gly Gln Tyr Met Phe Val Gln		
660 665 670		
tgt cca gct gtt tct cca ttc gag tgg cat cca ttt tcc att act tca	2064	
Cys Pro Ala Val Ser Pro Phe Glu Trp His Pro Phe Ser Ile Thr Ser		
675 680 685		
gct cct ggg gat gac tac ttg agc att cac atc cgg caa ctt ggt gac	2112	
Ala Pro Gly Asp Asp Tyr Leu Ser Ile His Ile Arg Gln Leu Gly Asp		
690 695 700		
tgg actcaa gaa ctc aag cgg gtc ttt tct gag gct tgc gag cgg cca	2160	
Trp Thr Gln Glu Leu Lys Arg Val Phe Ser Glu Ala Cys Glu Arg Pro		
705 710 715 720		
gag gct gga aag agt ggc ctg ctc aga gct gac gaa aac act aag aaa	2208	
Glu Ala Gly Lys Ser Gly Leu Leu Arg Ala Asp Glu Asn Thr Lys Lys		
725 730 735		
agt ttg cca aag cta tta ata gat gga cct tac gga gct cca gca caa	2256	
Ser Leu Pro Lys Leu Leu Ile Asp Gly Pro Tyr Gly Ala Pro Ala Gln		
740 745 750		
gat tac cga aaa tat gat gtc ttg ctg ctt gtt ggt ctt ggc att gga	2304	
Asp Tyr Arg Lys Tyr Asp Val Leu Leu Leu Val Gly Leu Gly Ile Gly		
755 760 765		
gca acg ccg ttc ata agt atc ctg aaa gac ttg ctc gtt aac atc gtg	2352	
Ala Thr Pro Phe Ile Ser Ile Leu Lys Asp Leu Leu Val Asn Ile Val		
770 775 780		
aaa atg gag gag caa gca gat tta gcc tca gat ttc agt ggg aac tca	2400	
Lys Met Glu Glu Gln Ala Asp Leu Ala Ser Asp Phe Ser Gly Asn Ser		
785 790 795 800		
gac atg agc gtt gcg aca agt gaa caa cca gct ctc aac aag att tct	2448	
Asp Met Ser Val Ala Thr Ser Glu Gln Pro Ala Leu Asn Lys Ile Ser		
805 810 815		
ctg aaa agg aga aag agc act cta aga acc aca aat gca tat ttt tat	2496	
Leu Lys Arg Arg Lys Ser Thr Leu Arg Thr Thr Asn Ala Tyr Phe Tyr		
820 825 830 835		
tgg gtg acc ccg gag caa gga tca ttt gat tgg ttc aaa ggc gtt atg	2544	
Trp Val Thr Arg Glu Gln Gly Ser Phe Asp Trp Phe Lys Gly Val Met		
835 840 845		
aac gaa gtg gct gaa ctt gat caa agg ggg gtc atc gag atg cat aac	2592	
Asn Glu Val Ala Glu Leu Asp Gln Arg Gly Val Ile Glu Met His Asn		
850 855 860		
tac ttg acg agt gtt tat gag gaa ggg gat gct cgt tca gct ctc att	2640	
Tyr Leu Thr Ser Val Tyr Glu Glu Gly Asp Ala Arg Ser Ala Leu Ile		
865 870 875 880		
acc atg gtc cag gca ctt aac cat gct aag aat ggg gtt gat att gta	2688	
Thr Met Val Gln Ala Leu Asn His Ala Lys Asn Gly Val Asp Ile Val		
885 890 895		
tca ggc acc agg gtg agg aca cat ttt gct agg cca aat tgg aag aaa	2736	
Ser Gly Thr Arg Val Arg Thr His Phe Ala Arg Pro Asn Trp Lys Lys		
900 905 910		
gta ttt tcc aag acc tta acc aag cat gca aat gca aga ata ggg gtt	2784	
Val Phe Ser Lys Thr Leu Thr Lys His Ala Asn Ala Arg Ile Gly Val		
915 920 925		
ttc tac tgt ggt gca ccc gta tta gca aaa gaa ctc agc aaa ctc tgc	2832	
Phe Tyr Cys Gly Ala Pro Val Leu Ala Lys Glu Leu Ser Lys Leu Cys		
930 935 940		
aaa gag tat aat caa aag ggt gca aca aag ttc gag ttt cac aaa gaa	2880	
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cat ttt tag		
His Phe		
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<211> 962		

Sequence Listing

<212> PRT

<213> Nicotiana tabacum

<400> 6

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Gly Tyr Asn Ser Gly Phe Ala Ser Glu Glu Phe Val Glu Val Thr Leu
35 40 45
Asp Leu Gln Asp Asp Asp Thr Ile Ile Leu Arg Ser Val Glu Pro Ala
50 55 60
Thr Val Ile Asn Ile Asp Ala Pro Asp Leu Pro Ala Gly Val Gly Ile
65 70 75 80
Ser Gly Val Ser Ile Glu Thr Pro Thr Ser Ala Ser Val Ser Glu Ser
85 90 95
Arg Ser Pro Thr Ile Arg Arg Ser Ser Ser Lys Leu Arg Gln Phe
100 105 110
Ser Gln Glu Leu Lys Ala Glu Ala Val Ala Lys Ala Arg Gln Phe Ser
115 120 125
Gln Glu Leu Lys Ala Glu Leu Arg Arg Phe Ser Trp Ser His Gly His
130 135 140
Ala Ser Arg Ala Phe Ser Pro Ser Ser Phe Phe Gln Asn Ala Val Val
145 150 155 160
Gly Thr Gly Asn Gly Val Asp Ser Ala Leu Ala Ala Arg Ala Leu Arg
165 170 175
Arg Gln Arg Ala Gln Leu Asp Arg Thr Arg Ser Ser Ala His Arg Ala
180 185 190
Leu Arg Arg Leu Lys Phe Ile Ser Asn Asn Lys Thr Asn Gly Trp Asn
195 200 205
Glu Val Glu Asn Asn Phe Ser Lys Leu Ala Lys Asp Gly Tyr Leu Tyr
210 215 220
Arg Ser Asp Phe Ala Gln Cys Ile Gly Met Lys Asp Ser Lys Glu Phe
225 230 235 240
Ala Leu Glu Leu Phe Asp Ala Leu Ser Arg Arg Arg Arg Leu Lys Val
245 250 255
Asp Lys Ile Ser Lys Glu Glu Leu Tyr Glu Tyr Trp Ser Gln Ile Thr
260 265 270
Asp Gln Ser Phe Asp Ser Arg Leu Gln Ile Ser Phe Asp Met Val Asp
275 280 285
Lys Asn Glu Asp Gly Arg Ile Ala Glu Glu Glu Val Lys Glu Ile Ile
290 295 300
Met Leu Ser Ala Ser Ala Asn Lys Leu Ser Arg Leu Lys Glu Gln Ala
305 310 315 320
Glu Glu Tyr Ala Ala Leu Ile Met Glu Glu Leu Asp Pro Glu Arg Leu
325 330 335
Gly Tyr Ile Glu Leu Trp Gln Leu Glu Thr Leu Leu Leu Gln Lys Asp
340 345 350
Thr Tyr Leu Asn Tyr Ser Gln Ala Leu Ser Tyr Thr Ser Gln Ala Leu
355 360 365
Ser Gln Asn Leu His Gly Leu Arg Lys Lys Ser Pro Ile Lys Arg Met
370 375 380
Ser Thr Lys Leu Val Tyr Ser Leu Gln Glu Asn Trp Lys Arg Ile Trp
385 390 395 400
Val Leu Thr Leu Trp Ile Leu Ile Met Ile Gly Leu Phe Leu Trp Lys
405 410 415
Phe Tyr Gln Tyr Lys Asn Lys Ser Ala Phe Arg Val Met Gly Tyr Cys
420 425 430
Leu Val Thr Ala Lys Gly Ala Ala Glu Thr Leu Lys Phe Asn Met Ala
435 440 445
Leu Ile Leu Leu Pro Val Cys Arg Asn Thr Ile Thr Trp Leu Arg Ser
450 455 460
Thr Lys Leu Ser His Phe Val Pro Phe Asp Asp Asn Ile Asn Phe His
465 470 475 480

Sequence Listing

Lys Thr Val Ala Ala Ala Ile Val Thr Gly Ile Ile Leu His Ala Gly
485 490 495
Asn His Leu Val Cys Asp Phe Pro Arg Leu Ile His Ala Asp Asp Gln
500 505 510
Asp Tyr Gln Ser Phe Leu Ser Asn Asp Phe Gly Gln Ser Lys Pro Gly
515 520 525
Tyr Ile Asp Leu Val Lys Gly Val Glu Gly Val Thr Gly Ile Ile Met
530 535 540
val Ile Leu Met Ala Ile Ala Phe Thr Leu Ala Thr Arg Trp Phe Arg
545 550 555 560
Arg Ser Leu Ile Lys Leu Pro Lys Pro Phe Asp Arg Leu Thr Gly Phe
565 570 575
Asn Ala Phe Trp Tyr Ser His His Leu Leu Val Ile Val Tyr Ile Leu
580 585 590
Leu Ile Ile His Gly Thr Phe Leu Phe Leu Val His Lys Trp Tyr Ser
595 600 605
Lys Thr Thr Trp Met Tyr Leu Ala Val Pro Val Leu Leu Tyr Ala Gly
610 615 620
Glu Arg Thr Leu Arg Phe Phe Arg Ser Gly Leu Tyr Thr Val Arg Leu
625 630 635 640
Leu Lys Val Ala Ile Tyr Pro Gly Asn Val Leu Thr Leu Gln Met Ser
645 650 655
Lys Pro Pro Gln Phe Arg Tyr Lys Ser Gly Gln Tyr Met Phe Val Gln
660 665 670
Cys Pro Ala Val Ser Pro Phe Glu Trp His Pro Phe Ser Ile Thr Ser
675 680 685
Ala Pro Gly Asp Asp Tyr Leu Ser Ile His Ile Arg Gln Leu Gly Asp
690 695 700
Trp Thr Gln Glu Leu Lys Arg Val Phe Ser Glu Ala Cys Glu Arg Pro
705 710 715 720
Glu Ala Gly Lys Ser Gly Leu Leu Arg Ala Asp Glu Asn Thr Lys Lys
725 730 735
Ser Leu Pro Lys Leu Leu Ile Asp Gly Pro Tyr Gly Ala Pro Ala Gln
740 745 750
Asp Tyr Arg Lys Tyr Asp Val Leu Leu Leu Val Gly Leu Gly Ile Gly
755 760 765
Ala Thr Pro Phe Ile Ser Ile Leu Lys Asp Leu Leu Val Asn Ile Val
770 775 780
Lys Met Glu Glu Gln Ala Asp Leu Ala Ser Asp Phe Ser Gly Asn Ser
785 790 795 800
Asp Met Ser Val Ala Thr Ser Glu Gln Pro Ala Leu Asn Lys Ile Ser
805 810 815
Leu Lys Arg Arg Lys Ser Thr Leu Arg Thr Thr Asn Ala Tyr Phe Tyr
820 825 830
Trp Val Thr Arg Glu Gln Gly Ser Phe Asp Trp Phe Lys Gly Val Met
835 840 845
Asn Glu Val Ala Glu Leu Asp Gln Arg Gly val Ile Glu Met His Asn
850 855 860
Tyr Leu Thr Ser Val Tyr Glu Glu Gly Asp Ala Arg Ser Ala Leu Ile
865 870 875 880
Thr Met Val Gln Ala Leu Asn His Ala Lys Asn Gly Val Asp Ile Val
885 890 895
Ser Gly Thr Arg Val Arg Thr His Phe Ala Arg Pro Asn Trp Lys Lys
900 905 910
val Phe Ser Lys Thr Leu Thr Lys His Ala Asn Ala Arg Ile Gly Val
915 920 925
Phe Tyr Cys Gly Ala Pro Val Leu Ala Lys Glu Leu Ser Lys Leu Cys
930 935 940
Lys Glu Tyr Asn Gln Lys Gly Ala Thr Lys Phe Glu Phe His Lys Glu
945 950 955 960
His Phe

Sequence Listing

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<213> Solanum tuberosum
<220>
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<222> (92)..(2980)
<223> coding for NADPH oxidase
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tatttatcta ttgtgctttg atttgggaca a atg agg ggt tta cct ggg cat 112
Met Arg Gly Leu Pro Gly His
1 5
gaa cgc cg 10 15 20
Glu Arg Arg Trp Thr Ser Asp Thr Val Ser Ser Gly Lys Asp Leu Ser
ggt gag tca tcg ccg gga act gat tcc ggg aat att tcc ggt ttt gct 208
Gly Glu Ser Ser Pro Gly Thr Asp Ser Gly Asn Ile Ser Gly Phe Ala
25 30 35
tcc gag gag ttt gtt gaa gtt ata ctt gat ctt cag gat gat gat acg 256
Ser Glu Glu Phe Val Glu Val Ile Leu Asp Leu Gln Asp Asp Asp Thr
40 45 50 55
att att cta cgg agc gtt gaa ccg gct act gta atc aac att gat gct 304
Ile Ile Leu Arg Ser Val Glu Pro Ala Thr Val Ile Asn Ile Asp Ala
60 65 70
tct gat cct gct acc gga gtc ggt att ggt gga gta tcg att gaa act 352
Ser Asp Pro Ala Thr Gly Val Gly Ile Gly Gly Val Ser Ile Glu Thr
75 80 85
ccg gcg tcg ctg act tcg acg tcg gga act cga tcg ccg acg atg cgt 400
Pro Ala Ser Leu Thr Ser Thr Ser Gly Thr Arg Ser Pro Thr Met Arg
90 95 100
cg 105 110 115
Arg Ser Thr Ser Asn Lys Leu Arg Gln Phe Ser Gln Glu Leu Lys Ala
gag gct gtc gcg 120 125 130 135
aaa gcg aag cat ttc tcg caa gag ctt aaa gcg gag 496
Glu Ala Val Ala Lys Ala Lys His Phe Ser Gln Glu Leu Lys Ala Glu
ct 140 145 150
cta agg aga ttc tca tgg agc cat gga cat gcg tct cgc act ttt tcg 544
Leu Arg Arg Phe Ser Trp Ser His Gly His Ala Ser Arg Thr Phe Ser
ccg gcg tcg 155 160 165
ttt ttc caa aac gcc gtc gtc ggt aca ggc aac ggt gta 592
Pro Ala Ser Phe Phe Gln Asn Ala Val Val Gly Thr Gly Asn Gly Val
gat tcg gct 170 175 180
tta gca gct cga gca tta cga cgg cag cgc gct cag ctc 640
Asp Ser Ala Leu Ala Ala Arg Ala Leu Arg Arg Gln Arg Ala Gln Leu
gat cgg act cgt tcc 185 190 195
agc gct cac aag gct ctt cgt gga ctc aaa ttc 688
Asp Arg Thr Arg Ser Ser Ala His Lys Ala Leu Arg Gly Leu Lys Phe
atc agc aat aac 200 205 210 215
aaa act aac gac gga tgg aat gaa gtt gaa aac aat ttt 736
Ile Ser Asn Asn Lys Thr Asn Gly Trp Asn Glu Val Glu Asn Asn Phe
gct aag ctc gct 220 225 230
aaa gac ggt tac ctt tat cgc tcc gat ttc gca caa 784
Ala Lys Leu Ala Lys Asp Gly Tyr Leu Tyr Arg Ser Asp Phe Ala Gln
tgc atc ggt 235 240 245
atg aag gat tca aag gaa ttt gca ttg gaa ttg ttt gat 832
Cys Ile Gly Met Lys Asp Ser Lys Glu Phe Ala Leu Glu Leu Phe Asp
gct ttg agt 250 255 260
aga aga aga aga aga ttg aag gtt gat aag att agc aaa gag 880
Ala Leu Ser Arg Arg Arg Leu Lys Val Asp Lys Ile Ser Lys Glu
gaa ttg tat 250 255 260
gag tat tgg tct caa atc acc gat cag agt ttc gat tct 928
Glu Leu Tyr Glu Tyr Trp Ser Gln Ile Thr Asp Gln Ser Phe Asp Ser

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Sequence Listing

265	270	275														
cg g	c t t	c a g	atc	t t c	t t c	g a c	at g	gt g	g a c	a g	a a t	g a a	g a t	g g t	c g a	976
Arg	Leu	Gln	Ile	Phe	Phe	Asp	Met	Val	Asp	Lys	Asn	Glu	Asp	Gly	Arg	
280					285				290						295	
att	g g t	g a a	g a a	g t a	aaa	g a g	atc	atc	at g	ct a	agt	g c c	t c t	g c a	1024	
Ile	Gly	Glu	Glu	Val	Lys	Glu	Ile	Ile	Met	Leu	Ser	Ala	Ser	Ala		
					300				305					310		
aac	aaa	t t a	t c a	aga	t t a	aaa	g a a	caa	g c a	g a g	g a g	t a t	g c a	g c t	ct g	1072
Asn	Lys	Leu	Ser	Arg	Leu	Lys	Glu	Gln	Ala	Glu	Glu	Tyr	Ala	Ala	Leu	
					315				320					325		
atc	at g	g a a	t t a	g a t	c c t	g a a	ag a	c t t	gg c	ta c	at t	ga g a	ct a	tt g	1120	
Ile	Met	Glu	Glu	Leu	Asp	Pro	Glu	Arg	Leu	Gly	Tyr	Ile	Glu	Leu	Trp	
					330				335					340		
cag	ct g	g a a	ac g	c t t	ct c	ca a a	a a g	g a c	ac t	ta c	tc t	aa c a	ta c	ag t	1168	
Gln	Leu	Glu	Thr	Leu	Leu	Gln	Lys	Asp	Thr	Tyr	Leu	Asn	Tyr	Ser		
					345				350					355		
caa	g c a	ct a	ag c	ta c	ac a	ca a g	g c t	tt g	ag c	ca a a	ac c t	ca a g	gg g	gg g	1216	
Gln	Ala	Leu	Ser	Tyr	Thr	Ser	Gln	Ala	Leu	Ser	Gln	Asn	Leu	Gln	Gly	
					360				365					375		
ttg	agg	a a g	ag a	ag c	cc a	at a	ag a	ag a	at g	ag c	ac a	aa a t	ct t	gt c	ta t	1264
Leu	Arg	Lys	Arg	Ser	Pro	Ile	Arg	Arg	Met	Ser	Thr	Lys	Leu	Val	Tyr	
					380				385					390		
tca	ct g	ca a g	g a a	aat	t t g	a a g	ga g a	att	t t g	ct t	gt c	tt g	tt g	tt g	att	1312
Ser	Leu	Gln	Glu	Asn	Trp	Lys	Arg	Ile	Trp	Val	Leu	Val	Leu	Trp	Ile	
					395				400					405		
ttg	ata	at g	ttt	g g a	ct t	tt t	t t g	a a g	t t c	ta t	ct t	ta c	aa a a	c a g	1360	
Leu	Ile	Met	Ile	Gly	Leu	Phe	Trp	Lys	Phe	Tyr	Leu	Tyr	Lys	Gln		
					410				415					420		
aaa	agt	g c a	ttt	caa	gt t	at g	gt t	ta t	tg c	ct t	ca a g	g c t	aa a g	gg g	1408	
Lys	Ser	Ala	Phe	Gln	Val	Met	Gly	Tyr	Cys	Leu	Leu	Thr	Ala	Lys	Gly	
					425				430					435		
gct	g c t	g a g	act	ct a	a a g	t t c	aa c	at g	gt t	ta t	tt g	tt g	cc a t	gt t	1456	
Ala	Ala	Glu	Thr	Leu	Lys	Phe	Asn	Met	Ala	Leu	Ile	Leu	Leu	Pro	Val	
					440				445					455		
tgc	agg	a a c	acc	att	aca	t t c	ct c	agg	t t c	act	aa a a	tt g	ag t	t g t	tt t	1504
Cys	Arg	Asn	Thr	Ile	Thr	Phe	Leu	Arg	Ser	Thr	Lys	Leu	Ser	Cys	Phe	
					460				465					470		
gta	ccc	ttt	gat	gac	aa c	at c	aa c	t t c	ca c	a a g	ac t	gt t	g c t	ga c c	1552	
Val	Pro	Phe	Asp	Asp	Asn	Ile	Asn	Phe	His	Lys	Thr	Val	Ala	Ala	Ala	
					475				480					485		
att	gt t	act	gg t	at c	at a	ct c	cat	gg c	g g t	aat	cat	ct t	gt t	t g t	at t	1600
Ile	Val	Thr	Gly	Ile	Ile	Leu	His	Ala	Gly	Asn	His	Leu	Val	Cys	Asp	
					490				495					500		
ttc	cca	a a g	ttt	ata	cat	g c a	aat	a a g	ac t	aat	ta t	ca a g	aa a g	tt g	tt g	1648
Phe	Pro	Lys	Leu	Ile	His	Ala	Asn	Asn	Thr	Asn	Tyr	Gln	Lys	Tyr	Leu	
					505				510					515		
gt g	aat	gat	ttt	gg c	cca	ag c	c a g	c t c	ca c	ta t	gat	ct t	gt t	aa a a	1696	
Val	Asn	Asp	Phe	Gly	Pro	Ser	Gln	Pro	Gln	Tyr	Ile	Asp	Leu	Val	Lys	
					520				525					530		
gga	gt g	gag	gg t	aca	g g a	at a	at a	at g	gt t	at c	at c	at g	gt c	at t	tt t	1744
Gly	Val	Glu	Gly	Val	Thr	Gly	Ile	Ile	Met	Val	Ile	Leu	Met	Ala	Ile	
					540				545					550		
gct	t t c	act	ct t	g c a	ac g	cg a	t t g	tt t	agg	cg g	ag c	ct t	at g	gt c	tt t	1792
Ala	Phe	Thr	Leu	Ala	Thr	Arg	Trp	Phe	Arg	Arg	Ser	Leu	Ile	Lys	Phe	
					555				560					565		
ccc	aaa	c c t	ttt	gat	aga	ct c	act	gg t	t t c	aat	g c g	t t c	t g g	ta c	tc g	1840
Pro	Lys	Pro	Phe	Asp	Arg	Leu	Thr	Gly	Phe	Asn	Ala	Phe	Trp	Tyr	Ser	
					570				575					580		
cac	cac	ct c	at c	att	gt c	tac	at c	gt t	ct c	at c	at c	cat	gg c	aca	1888	
His	His	Leu	Leu	Ile	Ile	Val	Tyr	Ile	Val	Leu	Ile	Ile	His	Gly	Thr	
					585				590					595		
ttc	ctc	tac	ctt	gt g	cat	aa c	t t g	tac	t t c	aaa	ac g	ac a t	t g g	at t	ta t	1936
Phe	Leu	Tyr	Leu	Val	His	Asn	Trp	Tyr	Ser	Lys	Thr	Thr	Trp	Met	Tyr	

Sequence Listing

600	605	610	615	
cta gca gtt cct gta	ctt ctc tac gca ggg	gaa aga act ctt	aga ttc	1984
Leu Ala Val Pro Val	Leu Leu Tyr Ala Gly	Glu Arg Thr Leu	Arg Phe	
620	625	630		
tcc cga tca ggc tta	tat aca gtc cgg	ctt cta aaa gta	gca ata tat	2032
Phe Arg Ser Gly Leu	Tyr Thr Val Arg	Leu Leu Lys Val	Ala Ile Tyr	
635	640	645		
cct gga aat gtc ctt	act ctg caa atg	tct aag cct ccg	caa ttt cga	2080
Pro Gly Asn Val Leu	Thr Leu Gln Met	Ser Lys Pro Pro	Gln Phe Arg	
650	655	660		
tac aag agt gga caa	tat atg ttt gtc	cag tgt cca	gct gtt tct cca	2128
Tyr Lys Ser Gly Gln	Tyr Met Phe Val	Gln Cys Pro	Ala Val Ser Pro	
665	670	675		
ttc gag tgg cat cca	ttt tcc att act tca	gct cct ggg	gat gac tac	2176
Phe Glu Trp His Pro	Phe Ser Ile Thr	Ser Ala Pro	Gly Asp Asp Tyr	
680	685	690	695	
ttg agc att cat atc	cga caa ctt ggt	gac tgg act	caa gaa ctc aag	2224
Leu Ser Ile His Ile	Arg Gln Leu Gly	Asp Trp Thr Gln	Glu Leu Lys	
700	705	710		
cgg gtg ttt tcc gag	gct tgc gag cag	cca gag gct	gga aag agt ggc	2272
Arg Val Phe Ser Glu	Ala Cys Glu Gln	Pro Glu Ala Gly	Lys Ser Gly	
715	720	725		
ctg ctc aga gct gac	gaa aac acc aaa	aca agt ttg	cca aag cta ttg	2320
Leu Leu Arg Ala Asp	Glu Asn Thr Lys	Ser Leu Pro	Lys Leu Leu	
730	735	740		
ata gat gga cct tat	gga gct cca gca	caa gat tac	cga aag tat gat	2368
Ile Asp Gly Pro Tyr	Gly Ala Pro Ala	Gln Asp Tyr	Arg Lys Tyr Asp	
745	750	755		
gtc tta ctg ctt gtt	ggt ctt ggc att	gga gca act ccc	ttt ata agt	2416
Val Leu Leu Val Gly	Leu Gly Ile Gly	Ala Thr Pro	Phe Ile Ser	
760	765	770	775	
atc ctg aaa gac ttg	ctc aaa aac atc	gtc aca atg	gag gag caa gca	2464
Ile Leu Lys Asp Leu	Leu Lys Asn Ile	Val Thr Met	Glu Glu Gln Ala	
780	785	790		
gat tta gtc tcg gat	ttt tca ggg aac	tca gac atg	agc gct gca aca	2512
Asp Leu Val Ser Asp	Phe Ser Gly Asn	Ser Asp Met	Ser Ala Ala Thr	
795	800	805		
agt gaa caa cca gct	ctc aac aag att	tct cca aaa	aag aga aag agt	2560
Ser Glu Gln Pro Ala	Leu Asn Lys Ile	Ser Pro Lys	Lys Arg Lys Ser	
810	815	820		
act cta aaa acc aca	aat gca tat ttt	tat tgg gtg	acc cgg gag caa	2608
Thr Leu Lys Thr Thr	Asn Ala Tyr Phe	Tyr Trp Val	Thr Arg Glu Gln	
825	830	835		
gga tca ttt gat tgg	ttc aaa ggt gtt	atg aac gaa	gtg gct gaa ctt	2656
Gly Ser Phe Asp Trp	Phe Lys Gly Val	Met Asn Glu Val	Ala Glu Leu	
840	845	850	855	
gat caa agg ggg gtc	atc gag atg cat	aac tac tta	acg agt gtt tat	2704
Asp Gln Arg Gly Val	Ile Glu Met His	Asn Tyr Leu	Thr Ser Val Tyr	
860	865	870		
gag gaa ggg gat gca	cgt tca gct ctc	att acc atg gtc	cag gcg ctt	2752
Glu Glu Gly Asp Ala	Arg Ser Ala Leu	Ile Thr Met Val	Gln Ala Leu	
875	880	885		
aac cat gct aag aat	ggg gtt gat att	gta tca ggc	acc agt gtg agg	2800
Asn His Ala Lys Asn	Gly Val Asp Ile	Val Ser Gly	Thr Ser Val Arg	
890	895	900		
aca cat ttt gcc aga	ccg aat tgg agg	aaa gta ttt	tcc aag acc tta	2848
Thr His Phe Ala Arg	Pro Asn Trp Arg	Lys Val Phe	Ser Lys Thr Leu	
905	910	915		
acc aag cat gca aat	gca aga ata gga	gtt ttc tac	tgc ggt gca ccc	2896
Thr Lys His Ala Asn	Ala Arg Ile Gly	Val Phe Tyr	Cys Gly Ala Pro	
920	925	930	935	
ata tta gct aaa gaa	ctc agc aaa ctc	tgc aaa gag	ttt aac caa aag	2944
Ile Leu Ala Lys Glu	Leu Ser Lys Leu	Cys Lys Glu	Phe Asn Gln Lys	

Sequence Listing

940

945

950

2990

gac aca acg aag ttc gag ttt cac aaa gaa cat ttt tagaaggccc
 Gly Thr Thr Lys Phe Glu Phe His Lys Glu His Phe
 955 960

tggagtagcaa ttaatcttgc atcaacggta cacacatcg taaaaccagta tttaccacat 3050
 ctatcttgg tacctgatt gatgattcta ctgaagacat aacatttagta aggaataagt 3110
 cagagacaaa ttgtacataa taggaggaag cacattaca gagaaaatac ataccaatat 3170
 gatatgtgtat taggtttgtt atattcagtc atctgttac acataccaa cttcagaact 3230
 ccaaaaggaa gactctgctt tggctctgatg gcttagaata tgggagggaa aaaaagacga 3290
 caattgaatg gtcacgatac acatgaagaa tgagaatatt gggaaacagc taataagaag 3350
 ttgaccttct tgataaaagaa acactatgaa aatggcaagc atgaaaaggac agacaatcat 3410
 ggcttggatg gggaaaacaa aatacaattt tgaaagaaga agataatatt agtaggagta 3470
 gtgggggact gatagctttg ttggctgaaac ttataatggg gctaaggaa tccttc当地 3530
 aaatgtctat gtagtaacta cttttctt tgcttgta gtattttg gggattttt 3590
 atatactact tattagataa gaggatagaa aatacgtgtat tatcaattc ttattagtaa 3650
 agtttatctg tagtagttct ttaatctgga gaaaggtaat atcaaaggaa atatctcatc 3710
 gaaaaaaaaaaaaaaa aaa 3733

<210> 8

<211> 963

<212> PRT

<213> Solanum tuberosum

<400> 8

Met	Arg	Gly	Leu	Pro	Gly	His	Glu	Arg	Arg	Trp	Thr	Ser	Asp	Thr	Val
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Ser	Ser	Gly	Lys	Asp	Leu	Ser	Gly	Glu	Ser	Ser	Pro	Gly	Thr	Asp	Ser
Gly	Asn	Ile	Ser	Gly	Phe	Ala	Ser	Glu	Glu	Phe	Val	Glu	Val	Ile	Leu
Asp	Leu	Gln	Asp	Asp	Asp	Thr	Ile	Ile	Leu	Arg	Ser	Val	Glu	Pro	Ala
Thr	Val	Ile	Asn	Ile	Asp	Ala	Ser	Asp	Pro	Ala	Thr	Gly	Val	Gly	Ile
Gly	Gly	Val	Ser	Ile	Glu	Thr	Pro	Ala	Ser	Leu	Thr	Ser	Thr	Ser	Gly
Thr	Arg	Ser	Pro	Thr	Met	Arg	Arg	Ser	Thr	Ser	Asn	Lys	Leu	Arg	Gln
Phe	Ser	Gln	Glu	Leu	Lys	Ala	Glu	Ala	val	Ala	Lys	Ala	Lys	His	Phe
Ser	Gln	Glu	Leu	Lys	Ala	Glu	Leu	Arg	Arg	Phe	Ser	Trp	Ser	His	Gly
His	Ala	Ser	Arg	Thr	Phe	Ser	Pro	Ala	Ser	Phe	Phe	Gln	Asn	Ala	val
Val	Gly	Thr	Gly	Asn	Gly	Val	Asp	Ser	Ala	Leu	Ala	Ala	Arg	Ala	Leu
Arg	Arg	Gln	Arg	Ala	Gln	Leu	Asp	Arg	Thr	Arg	Ser	Ser	Ala	His	Lys
Ala	Leu	Arg	Gly	Leu	Lys	Phe	Ile	Ser	Asn	Asn	Lys	Thr	Asn	Gly	Trp
Asn	Glu	Val	Glu	Asn	Asn	Phe	Ala	Lys	Leu	Ala	Lys	Asp	Gly	Tyr	Leu
Tyr	Arg	Ser	Asp	Phe	Ala	Gln	Cys	Ile	Gly	Met	Lys	Asp	Ser	Lys	Glu
Phe	Ala	Leu	Glu	Leu	Phe	Asp	Ala	Leu	Ser	Arg	Arg	Arg	Arg	Leu	Lys
Val	Asp	Lys	Ile	Ser	Lys	Glu	Glu	Leu	Tyr	Glu	Tyr	Trp	Ser	Gln	Ile
Thr	Asp	Gln	Ser	Phe	Asp	Ser	Arg	Leu	Gln	Ile	Phe	Phe	Asp	Met	Val
Asp	Lys	Asn	Glu	Asp	Gly	Arg	Ile	Gly	Glu	Glu	Val	Lys	Glu	Ile	
Ile	Met	Leu	Ser	Ala	Ser	Ala	Asn	Lys	Leu	Ser	Arg	Leu	Lys	Glu	Gln
305	310	315	320												
Ala	Glu	Glu	Tyr	Ala	Ala	Leu	Ile	Met	Glu	Glu	Leu	Asp	Pro	Glu	Arg

Sequence Listing

	325	330	335												
Leu	Gly	Tyr	Ile	Glu	Leu	Trp	Gln	Leu	Glu	Thr	Leu	Leu	Leu	Gln	Lys
				340				345					350		
Asp	Thr	Tyr	Leu	Asn	Tyr	Ser	Gln	Ala	Leu	Ser	Tyr	Thr	Ser	Gln	Ala
				355				360				365			
Leu	Ser	Gln	Asn	Leu	Gln	Gly	Leu	Arg	Lys	Arg	Ser	Pro	Ile	Arg	Arg
				370			375				380				
Met	Ser	Thr	Lys	Leu	Val	Tyr	Ser	Leu	Gln	Glu	Asn	Trp	Lys	Arg	Ile
				385			390			395			400		
Trp	Val	Leu	Val	Leu	Trp	Ile	Leu	Ile	Met	Ile	Gly	Leu	Phe	Leu	Trp
						405			410				415		
Lys	Phe	Tyr	Leu	Tyr	Lys	Gln	Lys	Ser	Ala	Phe	Gln	Val	Met	Gly	Tyr
						420			425			430			
Cys	Leu	Leu	Thr	Ala	Lys	Gly	Ala	Ala	Glu	Thr	Leu	Lys	Phe	Asn	Met
						435			440			445			
Ala	Leu	Ile	Leu	Leu	Pro	Val	Cys	Arg	Asn	Thr	Ile	Thr	Phe	Leu	Arg
						450			455			460			
Ser	Thr	Lys	Leu	Ser	Cys	Phe	Val	Pro	Phe	Asp	Asp	Asn	Ile	Asn	Phe
						465			470			475			480
His	Lys	Thr	Val	Ala	Ala	Ala	Ile	Val	Thr	Gly	Ile	Ile	Leu	His	Ala
						485			490			495			
Gly	Asn	His	Leu	Val	Cys	Asp	Phe	Pro	Lys	Leu	Ile	His	Ala	Asn	Asn
						500			505			510			
Thr	Asn	Tyr	Gln	Lys	Tyr	Leu	Val	Asn	Asp	Phe	Gly	Pro	Ser	Gln	Pro
						515			520			525			
Gln	Tyr	Ile	Asp	Leu	Val	Lys	Gly	Val	Glu	Gly	Val	Thr	Gly	Ile	Ile
						530			535			540			
Met	Val	Ile	Leu	Met	Ala	Ile	Ala	Phe	Thr	Leu	Ala	Thr	Arg	Trp	Phe
						545			550			555			560
Arg	Arg	Ser	Leu	Ile	Lys	Phe	Pro	Lys	Pro	Phe	Asp	Arg	Leu	Thr	Gly
						565			570			575			
Phe	Asn	Ala	Phe	Trp	Tyr	Ser	His	His	Leu	Leu	Ile	Ile	Val	Tyr	Ile
						580			585			590			
Val	Leu	Ile	Ile	His	Gly	Thr	Phe	Leu	Tyr	Leu	Val	His	Asn	Trp	Tyr
						595			600			605			
Ser	Lys	Thr	Thr	Trp	Met	Tyr	Leu	Ala	Val	Pro	Val	Leu	Leu	Tyr	Ala
						610			615			620			
Gly	Glu	Arg	Thr	Leu	Arg	Phe	Phe	Arg	Ser	Gly	Leu	Tyr	Thr	Val	Arg
						625			630			635			640
Leu	Leu	Lys	Val	Ala	Ile	Tyr	Pro	Gly	Asn	Val	Leu	Thr	Leu	Gln	Met
						645			650			655			
Ser	Lys	Pro	Pro	Gln	Phe	Arg	Tyr	Lys	Ser	Gly	Gln	Tyr	Met	Phe	Val
						660			665			670			
Gln	Cys	Pro	Ala	Val	Ser	Pro	Phe	Glu	Trp	His	Pro	Phe	Ser	Ile	Thr
						675			680			685			
Ser	Ala	Pro	Gly	Asp	Asp	Tyr	Leu	Ser	Ile	His	Ile	Arg	Gln	Leu	Gly
						690			695			700			
Asp	Trp	Thr	Gln	Glu	Leu	Lys	Arg	Val	Phe	Ser	Glu	Ala	Cys	Glu	Gln
						705			710			715			720
Pro	Glu	Ala	Gly	Lys	Ser	Gly	Leu	Leu	Arg	Ala	Asp	Glu	Asn	Thr	Lys
						725			730			735			
Thr	Ser	Leu	Pro	Lys	Leu	Leu	Ile	Asp	Gly	Pro	Tyr	Gly	Ala	Pro	Ala
						740			745			750			
Gln	Asp	Tyr	Arg	Lys	Tyr	Asp	Val	Leu	Leu	Leu	Val	Gly	Leu	Gly	Ile
						755			760			765			
Gly	Ala	Thr	Pro	Phe	Ile	Ser	Ile	Leu	Lys	Asp	Leu	Leu	Lys	Asn	Ile
						770			775			780			
Val	Thr	Met	Glu	Glu	Gln	Ala	Asp	Leu	Val	Ser	Asp	Phe	Ser	Gly	Asn
						785			790			795			800
Ser	Asp	Met	Ser	Ala	Ala	Thr	Ser	Glu	Gln	Pro	Ala	Leu	Asn	Lys	Ile
						805			810			815			
Ser	Pro	Lys	Lys	Arg	Lys	Ser	Thr	Leu	Lys	Thr	Thr	Asn	Ala	Tyr	Phe
						820			825			830			

Sequence Listing

Tyr	Trp	Val	Thr	Arg	Glu	Gln	Gly	Ser	Phe	Asp	Trp	Phe	Lys	Gly	Val
835					840						845				
Met	Asn	Glu	Val	Ala	Glu	Leu	Asp	Gln	Arg	Gly	Val	Ile	Glu	Met	His
850					855						860				
Asn	Tyr	Leu	Thr	Ser	Val	Tyr	Glu	Glu	Gly	Asp	Ala	Arg	Ser	Ala	Leu
865					870					875					880
Ile	Thr	Met	Val	Gln	Ala	Leu	Asn	His	Ala	Lys	Asn	Gly	Val	Asp	Ile
					885					890					895
Val	Ser	Gly	Thr	Ser	Val	Arg	Thr	His	Phe	Ala	Arg	Pro	Asn	Trp	Arg
					900				905					910	
Lys	Val	Phe	Ser	Lys	Thr	Leu	Thr	Lys	His	Ala	Asn	Ala	Arg	Ile	Gly
					915				920					925	
Val	Phe	Tyr	Cys	Gly	Ala	Pro	Ile	Leu	Ala	Lys	Glu	Leu	Ser	Lys	Leu
					930				935					940	
Cys	Lys	Glu	Phe	Asn	Gln	Lys	Gly	Thr	Thr	Lys	Phe	Glu	Phe	His	Lys
					945				950					955	
Glu	His	Phe													960

<210> 9
<211> 3316

<212> DNA

<213> Lycopersicon esculentum

<220>

<221> CDS

<222> (146)..(3112)

<223> coding for NADPH oxidase

<400> 9

cgccactcgt	gccgaattcg	gcacgaggct	ctgaaaaact	tttcatacaa	agccaatcta	60										
tttctctctc	tttcttttgg	tcaggcttct	acagaaaact	ctgttttcaa	cgtatattta	120										
tttatttgtca	tttgatttgg	gacag	atg	agg	ggt	172										
			tta	cct	ggg											
			cat	ggg	cat											
			gaa	cat	gaa											
			cgc	cat	cgc											
			1	5												
Met	Arg	Gly	Leu	Pro	Gly	His	Glu	Arg								
cgg	tgg	acg	tcg	gat	acg	gtg	tct	tcc	ggg	aag	gat	tta	agt	ggt	gag	220
Arg	Trp	Thr	Ser	Asp	Thr	Val	Ser	Ser	Gly	Lys	Asp	Leu	Ser	Gly	Glu	
10	15					20						25				
tca	tcg	ccg	gga	act	gat	tcc	ggg	aat	att	tcc	ggt	ttt	gct	tcg	gag	268
Ser	Ser	Pro	Gly	Thr	Asp	Ser	Gly	Asn	Ile	Ser	Gly	Phe	Ala	Ser	Glu	
30	35					40										
gag	ttt	gtt	gaa	gtt	ata	ctt	gat	ctt	cag	gat	gat	acg	att	att		316
Glu	Phe	Val	Glu	Val	Ile	Leu	Asp	Leu	Gln	Asp	Asp	Asp	Thr	Ile	Ile	
45	50					55										
tta	cgg	agc	gtt	gaa	ccg	gct	act	gta	atc	aac	att	gat	ggt	tct	gat	364
Leu	Arg	Ser	Val	Glu	Pro	Ala	Thr	Val	Ile	Asn	Ile	Asp	Gly	Ser	Asp	
60	65					70										
cct	gct	tcc	gga	gtc	ggt	att	ggt	gga	gca	tcg	att	gaa	act	ccg	gcg	412
Pro	Ala	Ser	Gly	Val	Gly	Ile	Gly	Gly	Ala	Ser	Ile	Glu	Thr	Pro	Ala	
75	80					85										
tcg	gtg	acg	tcg	acg	tcg	gaa	act	cga	tcg	ccg	atg	atg	cgt	ccg	agt	460
Ser	Val	Thr	Ser	Thr	Ser	Glu	Thr	Arg	Ser	Pro	Met	Met	Arg	Arg	Ser	
90	95					100							105			
aca	tct	aat	aag	ttt	cgt	cag	ttt	tca	cag	gag	ttg	aaa	gct	gag	gct	508
Thr	Ser	Asn	Lys	Phe	Arg	Gln	Phe	Ser	Gln	Glu	Leu	Lys	Ala	Glu	Ala	
110	115					120										
gtt	gct	aaa	gct	aag	cat	ttc	tcg	caa	gag	ctt	aaa	gct	gag	ctt	agg	556
Val	Ala	Lys	Ala	Lys	His	Phe	Ser	Gln	Glu	Leu	Lys	Ala	Glu	Leu	Arg	
125	130					135										
aga	ttc	tca	tgg	agc	cat	gga	cat	gct	tct	cgt	gct	ttt	tcg	ccg	gct	604
Arg	Phe	Ser	Trp	Ser	His	Gly	His	Ala	Ser	Arg	Ala	Phe	Ser	Pro	Ala	
140	145					150										
tcg	ttt	ttc	caa	aac	gct	gtc	gta	aca	ggc	aac	ggt	gta	gac	tcg		652
Ser	Phe	Phe	Gln	Asn	Ala	Val	Val	Gly	Thr	Gly	Asn	Gly	Val	Asp	Ser	
155	160					165										

Sequence Listing

gct tta gcg gct cga gca tta cgt cgg cag cgt gct cag ctc gac cg	700
Ala Leu Ala Ala Arg Ala Leu Arg Arg Gln Arg Ala Gln Leu Asp Arg	
170 175 180 185	
act cgt tcc agc gca cac aag gct ctt cgt gga ctc aaa ttc atc agc	748
Thr Arg Ser Ser Ala His Lys Ala Leu Arg Gly Leu Lys Phe Ile Ser	
190 195 200	
aat aac aaa act aac gga tgg aat gaa gtt gaa aac aat ttc gct aag	796
Asn Asn Lys Thr Asn Gly Trp Asn Glu Val Glu Asn Asn Phe Ala Lys	
205 210 215	
ctc gct aaa gac ggt tac ctt tat cgt tcc gat ttc gca caa tgc atc	844
Leu Ala Lys Asp Gly Tyr Leu Tyr Arg Ser Asp Phe Ala Gln Cys Ile	
220 225 230	
ggt cag tac tca cgc cgg cga tca cta cag ttt aat tat aga tta att	892
Gly Gln Tyr Ser Arg Arg Ser Leu Gln Phe Asn Tyr Arg Leu Ile	
235 240 245	
aca tta att ttg att aat tat ttg gtt aaa ggt atg aag gat tca aag	940
Thr Leu Ile Leu Ile Asn Tyr Leu Val Lys Gly Met Lys Asp Ser Lys	
250 255 260 265	
gaa ttt gcg ttg gaa ttg ttt gat gct tta agt aga aga aga aga ttg	988
Glu Phe Ala Leu Glu Leu Phe Asp Ala Leu Ser Arg Arg Arg Arg Leu	
270 275 280	
aag gtt gat aag att agc caa gag gaa ttg tat gag tat tgg tct caa	1036
Lys Val Asp Lys Ile Ser Gln Glu Glu Leu Tyr Glu Tyr Trp Ser Gln	
285 290 295	
atc acc gat cag agt ttc gat tct cgg ctt cag atc ttc ttc gac atg	1084
Ile Thr Asp Gln Ser Phe Asp Ser Arg Leu Gln Ile Phe Phe Asp Met	
300 305 310	
gtg gac aag aat gaa gat ggt cga att ggt gaa gaa gaa gta aaa gag	1132
Val Asp Lys Asn Glu Asp Gly Arg Ile Gly Glu Glu Glu Val Lys Glu	
315 320 325	
atc atc atg cta agt gcc tct gca aac aaa tta tca aga tta aaa gaa	1180
Ile Ile Met Leu Ser Ala Ser Ala Asn Lys Leu Ser Arg Leu Lys Glu	
330 335 340 345	
caa gca gag gag tat gca gct ctg atc atg gaa gaa tta gat cct gaa	1228
Gln Ala Glu Glu Tyr Ala Ala Leu Ile Met Glu Glu Leu Asp Pro Glu	
350 355 360	
aga ctt ggc tac att gag cta tgg cag ctg gaa aca ctt ctc ctc caa	1276
Arg Leu Gly Tyr Ile Glu Leu Trp Gln Leu Glu Thr Leu Leu Leu Gln	
365 370 375	
aag gac act tac ctc aac tac agt caa gca cta agc tac aca agc caa	1324
Lys Asp Thr Tyr Leu Asn Tyr Ser Gln Ala Leu Ser Tyr Thr Ser Gln	
380 385 390	
gct ttg agc caa aat ctg caa ggg ttg agg aag aga agc cca ata aga	1372
Ala Leu Ser Gln Asn Leu Gln Gly Leu Arg Lys Arg Ser Pro Ile Arg	
395 400 405	
aga atg agc aca aaa ctt gtc tat tca ctg caa gag aat tgg aag aga	1420
Arg Met Ser Thr Lys Leu Val Tyr Ser Leu Gln Glu Asn Trp Lys Arg	
410 415 420 425	
att tgg gtt ctg gtc ttg tgg att ttg ata atg att gga ctt ttt ctt	1468
Ile Trp Val Leu Val Leu Trp Ile Leu Ile Met Ile Gly Leu Phe Leu	
430 435 440	
tgg aag ttc tat cag tac aaa cag aaa agt gca ttt caa gtc atg ggt	1516
Trp Lys Phe Tyr Gln Tyr Lys Gln Lys Ser Ala Phe Gln Val Met Gly	
445 450 455	
tat tgc ctt cta aca gct aag ggt gct gct gag act ctc aag ttc aac	1564
Tyr Cys Leu Leu Thr Ala Lys Gly Ala Ala Glu Thr Leu Lys Phe Asn	
460 465 470	
atg gct tta ata ttg ttg cca gta tgc agg aac acc att aca ttc ctc	1612
Met Ala Leu Ile Leu Leu Pro Val Cys Arg Asn Thr Ile Thr Phe Leu	
475 480 485	
agg tct act aaa ttg agc tgt ttt gta ccc ttt gat gac aac ata aac	1660
Arg Ser Thr Lys Leu Ser Cys Phe Val Pro Phe Asp Asp Asn Ile Asn	
490 495 500 505	

Sequence Listing

ttt cac aag act gtt gct gca gcc att gtc act ggt atc ata ctc cat	1708
Phe His Lys Thr Val Ala Ala Ala Ile Val Thr Gly Ile Ile Leu His	
510 515 520	
gcc ggt aat cac ctt gta tgt gat ttc cca aag ctt ata cat gca aat	1756
Ala Gly Asn His Leu Val Cys Asp Phe Pro Lys Leu Ile His Ala Asn	
525 530 535	
agt acg aat tat cag aaa tat ttg gtg aat gat ttt ggc cca agc cag	1804
Ser Thr Asn Tyr Gln Lys Tyr Leu Val Asn Asp Phe Gly Pro Ser Gln	
540 545 550	
cct cag tac ata gat ctt gtt aaa gga gtg gag ggt gtg act gga ata	1852
Pro Gln Tyr Ile Asp Leu Val Lys Gly Val Glu Gly Val Thr Gly Ile	
555 560 565	
gtt atg gta atc ctc atg gcc att gct ttc act ctt gca acg cga tgg	1900
Val Met Val Ile Leu Met Ala Ile Ala Phe Thr Leu Ala Thr Arg Trp	
570 575 580 585	
ttt agg cg ^g agc ctc att aag tta ccc aaa cct ttt gat aga ctc act	1948
Phe Arg Arg Ser Leu Ile Lys Leu Pro Lys Pro Phe Asp Arg Leu Thr	
590 595 600	
ggt ttc aat gcg ttc tgg tac tcg cac cac ctt ctc atc att gtc tac	1996
Gly Phe Asn Ala Phe Trp Tyr Ser His His Leu Leu Ile Ile Val Tyr	
605 610 615	
atc gta ctg atc atc cat ggc aca ttc ctc tac ctt gtg cat aac tgg	2044
Ile Val Leu Ile Ile His Gly Thr Phe Leu Tyr Leu Val His Asn Trp	
620 625 630	
tac tcc aaa acg aca tgg atg tat ata gca gtt cct gta ctt ctt tac	2092
Tyr Ser Lys Thr Thr Trp Met Tyr Ile Ala Val Pro Val Leu Leu Tyr	
635 640 645	
gca ggg gaa aga act ctt aga ttc ttc cga tca ggc tta tac agt gtc	2140
Ala Gly Glu Arg Thr Leu Arg Phe Phe Arg Ser Gly Leu Tyr Ser Val	
650 655 660 665	
cg ^g ctt cta aaa gta gca ata tat cct gga aat gtc ctt act ctg caa	2188
Arg Leu Leu Lys Val Ala Ile Tyr Pro Gly Asn Val Leu Thr Leu Gln	
670 675 680	
atg tct aag cct cc ^g caa ttt cga tac aag agt gga cag tat atg ttt	2236
Met Ser Lys Pro Pro Gln Phe Arg Tyr Lys Ser Gly Gln Tyr Met Phe	
685 690 695	
gtc cag tgt cca gct gtt tct cca ttc gag tgg cat cca ttt tcc att	2284
Val Gln Cys Pro Ala Val Ser Pro Phe Glu Trp His Pro Phe Ser Ile	
700 705 710	
act tca gct cct ggg gat gac tac ttg agc att cat atc cga caa ctt	2332
Thr Ser Ala Pro Gly Asp Asp Tyr Leu Ser Ile His Ile Arg Gln Leu	
715 720 725	
ggt gac tgg act caa gaa ctc aag cga gtg ttt tcc gag gct tgc gag	2380
Gly Asp Trp Thr Gln Glu Leu Lys Arg Val Phe Ser Glu Ala Cys Glu	
730 735 740 745	
cag cca gag gct gga aag agt ggc ctg ctc aga gct gac gaa aac acc	2428
Gln Pro Glu Ala Gly Lys Ser Gly Leu Leu Arg Ala Asp Glu Asn Thr	
750 755 760	
aaa aca agt ttg cca aag cta tta ata gat gga cct tat gga gct cca	2476
Lys Thr Ser Leu Pro Lys Leu Ile Asp Gly Pro Tyr Gly Ala Pro	
765 770 775	
gca caa gat tac cgg aag tat gat gtc tta ctg ctt gtt ggt ctt ggc	2524
Ala Gln Asp Tyr Arg Lys Tyr Asp Val Leu Leu Leu Val Gly Leu Gly	
780 785 790	
att gga gca act ccc ttt ata agt atc ctg aaa gac ttg ctc aaa aac	2572
Ile Gly Ala Thr Pro Phe Ile Ser Ile Leu Lys Asp Leu Leu Lys Asn	
795 800 805	
atc gtc gca atg gag gag caa gca gat tta gtc tcg gat ttc agt gga	2620
Ile Val Ala Met Glu Glu Gln Ala Asp Leu Val Ser Asp Phe Ser Gly	
810 815 820 825	
aac tcg gac atg agt gct gca aca agt gaa caa cca gct ctc aac aag	2668
Asn Ser Asp Met Ser Ala Ala Thr Ser Glu Gln Pro Ala Leu Asn Lys	
830 835 840	

Sequence Listing

att tct cca aaa aag aga aag agt act cta aaa acc aca aat gca tat Ile Ser Pro Lys Lys Arg Lys Ser Thr Leu Lys Thr Thr Asn Ala Tyr 845 850 855	2716
ttt tat tgg gtg acc cg ^g gag caa gga tca ttt gat tgg ttc aaa ggt Phe Tyr Trp Val Thr Arg Glu Gln Gly Ser Phe Asp Trp Phe Lys Gly 860 865 870	2764
gtt atg aat gaa gtg gct gaa ctt gat caa agg ggt gtc atc gag atg Val Met Asn Glu Val Ala Glu Leu Asp Gln Arg Gly Val Ile Glu Met 875 880 885	2812
cat aac tac ttg acg agt gtt tat gag gaa ggg gat gca cgt tca gct His Asn Tyr Leu Thr Ser Val Tyr Glu Glu Gly Asp Ala Arg Ser Ala 890 895 900 905	2860
ctc att acc atg gtc cag gca ctt aac cat gct aag aat ggg gtt gat Leu Ile Thr Met Val Gln Ala Leu Asn His Ala Lys Asn Gly Val Asp 910 915 920	2908
att gta tca ggc acc agt gtg agg aca cat ttc gcc agg ccg aat tgg Ile Val Ser Gly Thr Ser Val Arg Thr His Phe Ala Arg Pro Asn Trp 925 930 935	2956
agg aaa gta ttt tcc aag acc tta acc aag cat gca aat gca aga ata Arg Lys Val Phe Ser Lys Thr Leu Thr Lys His Ala Asn Ala Arg Ile 940 945 950	3004
gga gtt ttc tac tgt ggt gca ccc ata tta gct aaa gaa ctc agc caa Gly Val Phe Tyr Cys Gly Ala Pro Ile Leu Ala Lys Glu Leu Ser Gln 955 960 965	3052
ctc tgc aaa gag ttt aac caa aag ggc aca aca aag ttc gag ttt cac Leu Cys Lys Glu Phe Asn Gln Lys Gly Thr Thr Lys Phe Glu Phe His 970 975 980 985	3100
aaa gaa cat ttt tagaagggcc tggagtatga ttaatcttgc atcaacggta Lys Glu His Phe	3152
cacacatcta ct ^t tcggta ^c cttat ^t tgat tattctactg aagagataac attagtaagg aataagt ^c ag agataat ^t g tacataat ^a g ggaagaagac tatttcaaga gaaaatacat accaataaga t ^t gtgaaaaaaa aaaaaaaaaaaa aaaaactcg ^t gccc	3212 3272 3316

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<212> PRT

<213> Lycopersicon esculentum

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Ser Ser Gly Lys Asp Leu Ser Gly Glu Ser Ser Pro Gly Thr Asp Ser 20 25 30
Gly Asn Ile Ser Gly Phe Ala Ser Glu Glu Phe Val Glu Val Ile Leu 35 40 45
Asp Leu Gln Asp Asp Asp Thr Ile Ile Leu Arg Ser Val Glu Pro Ala 50 55 60
Thr Val Ile Asn Ile Asp Gly Ser Asp Pro Ala Ser Gly Val Gly Ile 65 70 75 80
Gly Gly Ala Ser Ile Glu Thr Pro Ala Ser Val Thr Ser Thr Ser Glu 85 90 95
Thr Arg Ser Pro Met Met Arg Arg Ser Thr Ser Asn Lys Phe Arg Gln 100 105 110
Phe Ser Gln Glu Leu Lys Ala Glu Ala Val Ala Lys Ala Lys His Phe 115 120 125
Ser Gln Glu Leu Lys Ala Glu Leu Arg Arg Phe Ser Trp Ser His Gly 130 135 140
His Ala Ser Arg Ala Phe Ser Pro Ala Ser Phe Phe Gln Asn Ala Val 145 150 155 160
Val Gly Thr Gly Asn Gly Val Asp Ser Ala Leu Ala Arg Ala Leu 165 170 175
Arg Arg Gln Arg Ala Gln Leu Asp Arg Thr Arg Ser Ser Ala His Lys 180 185 190
Ala Leu Arg Gly Leu Lys Phe Ile Ser Asn Asn Lys Thr Asn Gly Trp 195 200 205

Sequence Listing

Asn Glu Val Glu Asn Asn Phe Ala Lys Leu Ala Lys Asp Gly Tyr Leu
 210 215 220
 Tyr Arg Ser Asp Phe Ala Gln Cys Ile Gly Gln Tyr Ser Arg Arg Arg
 225 230 235 240
 Ser Leu Gln Phe Asn Tyr Arg Leu Ile Thr Leu Ile Leu Ile Asn Tyr
 245 250 255
 Leu Val Lys Gly Met Lys Asp Ser Lys Glu Phe Ala Leu Glu Leu Phe
 260 265 270
 Asp Ala Leu Ser Arg Arg Arg Leu Lys Val Asp Lys Ile Ser Gln
 275 280 285
 Glu Glu Leu Tyr Glu Tyr Trp Ser Gln Ile Thr Asp Gln Ser Phe Asp
 290 295 300
 Ser Arg Leu Gln Ile Phe Phe Asp Met Val Asp Lys Asn Glu Asp Gly
 305 310 315 320
 Arg Ile Gly Glu Glu Val Lys Glu Ile Ile Met Leu Ser Ala Ser
 325 330 335
 Ala Asn Lys Leu Ser Arg Leu Lys Glu Gln Ala Glu Glu Tyr Ala Ala
 340 345 350
 Leu Ile Met Glu Glu Leu Asp Pro Glu Arg Leu Gly Tyr Ile Glu Leu
 355 360 365
 Trp Gln Leu Glu Thr Leu Leu Gln Lys Asp Thr Tyr Leu Asn Tyr
 370 375 380
 Ser Gln Ala Leu Ser Tyr Thr Ser Gln Ala Leu Ser Gln Asn Leu Gln
 385 390 395 400
 Gly Leu Arg Lys Arg Ser Pro Ile Arg Arg Met Ser Thr Lys Leu Val
 405 410 415
 Tyr Ser Leu Gln Glu Asn Trp Lys Arg Ile Trp Val Leu Val Leu Trp
 420 425 430
 Ile Leu Ile Met Ile Gly Leu Phe Leu Trp Lys Phe Tyr Gln Tyr Lys
 435 440 445
 Gln Lys Ser Ala Phe Gln Val Met Gly Tyr Cys Leu Leu Thr Ala Lys
 450 455 460
 Gly Ala Ala Glu Thr Leu Lys Phe Asn Met Ala Leu Ile Leu Leu Pro
 465 470 475 480
 Val Cys Arg Asn Thr Ile Thr Phe Leu Arg Ser Thr Lys Leu Ser Cys
 485 490 495
 Phe Val Pro Phe Asp Asp Asn Ile Asn Phe His Lys Thr Val Ala Ala
 500 505 510
 Ala Ile Val Thr Gly Ile Ile Leu His Ala Gly Asn His Leu Val Cys
 515 520 525
 Asp Phe Pro Lys Leu Ile His Ala Asn Ser Thr Asn Tyr Gln Lys Tyr
 530 535 540
 Leu Val Asn Asp Phe Gly Pro Ser Gln Pro Gln Tyr Ile Asp Leu Val
 545 550 555 560
 Lys Gly Val Glu Gly Val Thr Gly Ile Val Met Val Ile Leu Met Ala
 565 570 575
 Ile Ala Phe Thr Leu Ala Thr Arg Trp Phe Arg Arg Ser Leu Ile Lys
 580 585 590
 Leu Pro Lys Pro Phe Asp Arg Leu Thr Gly Phe Asn Ala Phe Trp Tyr
 595 600 605
 Ser His His Leu Leu Ile Ile Val Tyr Ile Val Leu Ile Ile His Gly
 610 615 620
 Thr Phe Leu Tyr Leu Val His Asn Trp Tyr Ser Lys Thr Thr Trp Met
 625 630 635 640
 Tyr Ile Ala Val Pro Val Leu Leu Tyr Ala Gly Glu Arg Thr Leu Arg
 645 650 655
 Phe Phe Arg Ser Gly Leu Tyr Ser Val Arg Leu Leu Lys Val Ala Ile
 660 665 670
 Tyr Pro Gly Asn Val Leu Thr Leu Gln Met Ser Lys Pro Pro Gln Phe
 675 680 685
 Arg Tyr Lys Ser Gly Gln Tyr Met Phe Val Gln Cys Pro Ala Val Ser
 690 695 700
 Pro Phe Glu Trp His Pro Phe Ser Ile Thr Ser Ala Pro Gly Asp Asp

Sequence Listing

705	710	715	720
Tyr Leu Ser Ile His Ile Arg Gln Leu Gly Asp Trp Thr Gln Glu Leu			
725	730	735	
Lys Arg Val Phe Ser Glu Ala Cys Glu Gln Pro Glu Ala Gly Lys Ser			
740	745	750	
Gly Leu Leu Arg Ala Asp Glu Asn Thr Lys Thr Ser Leu Pro Lys Leu			
755	760	765	
Leu Ile Asp Gly Pro Tyr Gly Ala Pro Ala Gln Asp Tyr Arg Lys Tyr			
770	775	780	
Asp Val Leu Leu Val Gly Leu Gly Ile Gly Ala Thr Pro Phe Ile			
785	790	795	800
Ser Ile Leu Lys Asp Leu Leu Lys Asn Ile Val Ala Met Glu Glu Gln			
805	810	815	
Ala Asp Leu Val Ser Asp Phe Ser Gly Asn Ser Asp Met Ser Ala Ala			
820	825	830	
Thr Ser Glu Gln Pro Ala Leu Asn Lys Ile Ser Pro Lys Lys Arg Lys			
835	840	845	
Ser Thr Leu Lys Thr Thr Asn Ala Tyr Phe Tyr Trp Val Thr Arg Glu			
850	855	860	
Gln Gly Ser Phe Asp Trp Phe Lys Gly Val Met Asn Glu Val Ala Glu			
865	870	875	880
Leu Asp Gln Arg Gly Val Ile Glu Met His Asn Tyr Leu Thr Ser Val			
885	890	895	
Tyr Glu Glu Gly Asp Ala Arg Ser Ala Leu Ile Thr Met Val Gln Ala			
900	905	910	
Leu Asn His Ala Lys Asn Gly Val Asp Ile Val Ser Gly Thr Ser Val			
915	920	925	
Arg Thr His Phe Ala Arg Pro Asn Trp Arg Lys Val Phe Ser Lys Thr			
930	935	940	
Leu Thr Lys His Ala Asn Ala Arg Ile Gly Val Phe Tyr Cys Gly Ala			
945	950	955	960
Pro Ile Leu Ala Lys Glu Leu Ser Gln Leu Cys Lys Glu Phe Asn Gln			
965	970	975	
Lys Gly Thr Thr Lys Phe Glu Phe His Lys Glu His Phe			
980	985		

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 <211> 3080
 <212> DNA
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<220>
 <221> CDS
 <222> (15)..(2846)
 <223> coding for NADPH oxidase

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1 5 10		
tca ttt gat tca gtt tcc gcc gga aaa acc gcc gtc gga agt gca tca		98
Ser Phe Asp Ser Val Ser Ala Gly Lys Thr Ala Val Gly Ser Ala Ser		
15 20 25		
act tca ccg gga act gaa tac tcc att aac ggt gat caa gag ttc gtt		146
Thr Ser Pro Gly Thr Glu Tyr Ser Ile Asn Gly Asp Gln Glu Phe Val		
30 35 40		
gaa gtc aca atc gat ctt caa gac gat gac aca atc gtt ctt cgt agc		194
Glu Val Thr Ile Asp Leu Gln Asp Asp Asp Thr Ile Val Leu Arg Ser		
45 50 55 60		
gtc gag cca gca acc gcc att aat gtc atc gga gat atc tcc gac gac		242
Val Glu Pro Ala Thr Ala Ile Asn Val Ile Gly Asp Ile Ser Asp Asp		
65 70 75		
aac acc gga ata atg act ccg gtt tcg att tcg aga tct ccg acg atg		290
Asn Thr Gly Ile Met Thr Pro Val Ser Ile Ser Arg Ser Pro Thr Met		
80 85 90		

Sequence Listing

aaa cga act tca tct aat cgg ttc cga caa ttc tca caa gag ctt aaa	338
Lys Arg Thr Ser Ser Asn Arg Phe Arg Gln Phe Ser Gln Glu Leu Lys	
95 100 105	
gcc gaa gct gtg gcg aaa gcg aaa cag tta tct cag gag ttg aaa cga	386
Ala Glu Ala Val Ala Lys Ala Lys Gln Leu Ser Gln Glu Leu Lys Arg	
110 115 120	
tcc tca tgg tct cgt tct ttc tca ggt aac tta acc act act agt acc	434
Phe Ser Trp Ser Arg Ser Phe Ser Gly Asn Leu Thr Thr Thr Ser Thr	
125 130 135 140	
gcc gct aat caa agc ggc ggt gct ggt ggt ttg ttg aac tcg gct	482
Ala Ala Asn Gln Ser Gly Gly Ala Gly Gly Leu Val Asn Ser Ala	
145 150 155	
tta gaa gcg cga gcg ttg cga aag caa cgt gct cag tta gat cgg act	530
Leu Glu Ala Arg Ala Leu Arg Lys Gln Arg Ala Gln Leu Asp Arg Thr	
160 165 170	
cgg tct agt gct caa aga gct ctt cgt ggt ttg aga ttc att agc aat	578
Arg Ser Ser Ala Gln Arg Ala Leu Arg Gly Leu Arg Phe Ile Ser Asn	
175 180 185	
aag caa aag aac gtt gat ggt tgg aac gat gtt caa tca aat ttc gaa	626
Lys Gln Lys Asn Val Asp Gly Trp Asn Asp Val Gln Ser Asn Phe Glu	
190 195 200	
aaa ttc gaa aaa aat ggt tac atc tat cgc tcc gat ttc gct caa tgc	674
Lys Phe Glu Lys Asn Gly Tyr Ile Tyr Arg Ser Asp Phe Ala Gln Cys	
205 210 215 220	
ata gga atg aaa gat tcg aaa gaa ttt gca ttg gaa ctg ttc gat gca	722
Ile Gly Met Lys Asp Ser Lys Glu Phe Ala Leu Glu Leu Phe Asp Ala	
225 230 235	
ttg agt aga aga aga tta aaa gta gag aaa atc aat cac gat gag	770
Leu Ser Arg Arg Arg Leu Lys Val Glu Lys Ile Asn His Asp Glu	
240 245 250	
ctt tat gag tat tgg tca caa atc aac gac gag agt ttt gat tct cgt	818
Leu Tyr Glu Tyr Trp Ser Gln Ile Asn Asp Glu Ser Phe Asp Ser Arg	
255 260 265	
ctc cag atc ttc ttc gac ata gtc gac aag aat gaa gat ggg aga att	866
Leu Gln Ile Phe Phe Asp Ile Val Asp Lys Asn Glu Asp Gly Arg Ile	
270 275 280	
aca gaa gag gaa gta aaa gag ata ata atg ttg agt gca tct gca aat	914
Thr Glu Glu Glu Val Lys Glu Ile Ile Met Leu Ser Ala Ser Ala Asn	
285 290 295 300	
aag cta tca aga tta aag gaa caa gca gag gaa tat gca gct ttg att	962
Lys Leu Ser Arg Leu Lys Glu Gln Ala Glu Glu Tyr Ala Ala Leu Ile	
305 310 315	
atg gaa gag tta gat cct gaa aga ctt ggc tac ata gag cta tgg caa	1010
Met Glu Glu Leu Asp Pro Glu Arg Leu Gly Tyr Ile Glu Leu Trp Gln	
320 325 330	
cta gag act ttg ctt cta caa aaa gac aca tac ctc aat tac agt caa	1058
Leu Glu Thr Leu Leu Gln Lys Asp Thr Tyr Leu Asn Tyr Ser Gln	
335 340 345	
gca ttg agc tat acg agc caa gca ttg agc caa aac ctt caa ggg tta	1106
Ala Leu Ser Tyr Thr Ser Gln Ala Leu Ser Gln Asn Leu Gln Gly Leu	
350 355 360	
agg gga aag agt cga ata cat aga atg agt tcg gat ttc gtc tac att	1154
Arg Gly Lys Ser Arg Ile His Arg Met Ser Ser Asp Phe Val Tyr Ile	
365 370 375 380	
atg caa gag aat tgg aaa agg ata tgg gtt tta tcc tta tgg atc atg	1202
Met Gln Glu Asn Trp Lys Arg Ile Trp Val Leu Ser Leu Trp Ile Met	
385 390 395	
atc atg atc gga tta ttc ttg tgg aaa ttc ttc caa tac aag caa aaa	1250
Ile Met Ile Gly Leu Phe Leu Trp Lys Phe Phe Gln Tyr Lys Gln Lys	
400 405 410	
gat gca ttt cat gtg atg gga tat tgt tta ctc aca gcc aaa gga gca	1298
Asp Ala Phe His Val Met Gly Tyr Cys Leu Leu Thr Ala Lys Gly Ala	
415 420 425	

Sequence Listing

gct gaa aca ctt aaa ttc aac atg gct cta ata ctt ttc cca gtt tgc	1346
Ala Glu Thr Leu Lys Phe Asn Met Ala Leu Ile Leu Phe Pro Val Cys	
430 435 440	
aga aac acc att act tgg ctt aga tcc aca aga ctc tct tac ttc gtt	1394
Arg Asn Thr Ile Thr Trp Leu Arg Ser Thr Arg Leu Ser Tyr Phe Val	
445 450 455 460	
cct ttt gat gat aat atc aac ttc cac aag aca att gct gga gcc att	1442
Pro Phe Asp Asp Asn Ile Asn Phe His Lys Thr Ile Ala Gly Ala Ile	
465 470 475	
gta gta gct gtg atc ctt cat att gga gac cat ctt gct tgt gat ttc	1490
Val Val Ala Val Ile Leu His Ile Gly Asp His Leu Ala Cys Asp Phe	
480 485 490	
cct aga att gtt aga gcc acc gaa tac gat tac aat cgg tat ctg ttt	1538
Pro Arg Ile Val Arg Ala Thr Glu Tyr Asp Tyr Asn Arg Tyr Leu Phe	
495 500 505	
cat tac ttt caa aca aaa cag cca aca tac ttc gac ctc gtt aag gga	1586
His Tyr Phe Gln Thr Lys Gln Pro Thr Tyr Phe Asp Leu Val Lys Gly	
510 515 520	
cct gaa gga atc act ggg att tta atg gtc att ttg atg att att tca	1634
Pro Glu Gly Ile Thr Gly Ile Leu Met Val Ile Leu Met Ile Ile Ser	
525 530 535 540	
tcc aca tta gca aca aga tgg ttt agg cgt aac cta gtc aag ctt cct	1682
Phe Thr Leu Ala Thr Arg Trp Phe Arg Arg Asn Leu Val Lys Leu Pro	
545 550 555	
aag cca ttt gat cga cta acc ggt ttt aac gcc ttt tgg tat tcg cat	1730
Lys Pro Phe Asp Arg Leu Thr Gly Phe Asn Ala Phe Trp Tyr Ser His	
560 565 570	
cat ttg ttc gtc att gtt tat atc ttg ctt att ctt cat ggt atc ttc	1778
His Leu Phe Val Ile Val Tyr Ile Leu Leu Ile Leu His Gly Ile Phe	
575 580 585	
ctc tat ttc gcc aag cct tgg tat gtt cgt acg aca tgg atg tat ctt	1826
Leu Tyr Phe Ala Lys Pro Trp Tyr Val Arg Thr Thr Trp Met Tyr Leu	
590 595 600	
gca gta cca gtt tta ctc tat ggt gga gaa aga aca ctt agg tac ttc	1874
Ala Val Pro Val Leu Leu Tyr Gly Glu Arg Thr Leu Arg Tyr Phe	
605 610 615 620	
cgt tct ggt tct tat tcg gtt cga ctg ctt aag gtt gct ata tat cct	1922
Arg Ser Gly Ser Tyr Ser Val Arg Leu Leu Lys Val Ala Ile Tyr Pro	
625 630 635	
ggg aat gtt cta acg cta caa atg tcg aaa cca act caa ttt cgt tac	1970
Gly Asn Val Leu Thr Leu Gln Met Ser Lys Pro Thr Gln Phe Arg Tyr	
640 645 650	
aaa agc gga caa tac atg ttt gtc caa tgt cct gcg gtt tcg cca ttc	2018
Lys Ser Gly Gln Tyr Met Phe Val Gln Cys Pro Ala val Ser Pro Phe	
655 660 665	
gag tgg cat cca ttc tca att act tcc gca cct gaa gat gat tat atc	2066
Glu Trp His Pro Phe Ser Ile Thr Ser Ala Pro Glu Asp Asp Tyr Ile	
670 675 680	
agc att cac att aga caa ctt ggt gat tgg act caa gaa ctc aaa aga	2114
Ser Ile His Ile Arg Gln Leu Gly Asp Trp Thr Gln Glu Leu Lys Arg	
685 690 695 700	
gta ttc tct gaa gtt tgt gag cca ccg gtt ggc ggt aaa agc gga ctt	2162
Val Phe Ser Glu Val Cys Glu Pro Pro Val Gly Gly Lys Ser Gly Leu	
705 710 715	
ctc aga gcc gac gaa aca aca aag aaa agt ttg cca aag cta ttg ata	2210
Leu Arg Ala Asp Glu Thr Thr Lys Lys Ser Leu Pro Lys Leu Leu Ile	
720 725 730	
gat gga ccg tac ggt gca cca gca caa gat tat agg aaa tat gat gtt	2258
Asp Gly Pro Tyr Gly Ala Pro Ala Gln Asp Tyr Arg Lys Tyr Asp Val	
735 740 745	
ctc tta tta gtt ggt ctt ggc att ggt gca act cca ttt atc agt atc	2306
Leu Leu Leu Val Gly Leu Gly Ile Gly Ala Thr Pro Phe Ile Ser Ile	
750 755 760	

Sequence Listing

ttg aaa gat ttg ctt aac aac att gtt aaa atg gaa gag cat gcg gat	2354
Leu Lys Asp Leu Leu Asn Asn Ile Val Lys Met Glu Glu His Ala Asp	
765 770 775 780	
tcg atc tcg gat ttc agt aga tca tca gaa tac agc aca gga agc aac	2402
Ser Ile Ser Asp Phe Ser Arg Ser Ser Glu Tyr Ser Thr Gly Ser Asn	
785 790 795	
ggt gac acg cca aga cga aag aga ata cta aaa acc aca aat gct tat	2450
Gly Asp Thr Pro Arg Arg Lys Arg Ile Leu Lys Thr Thr Asn Ala Tyr	
800 805 810	
tcc tac tgg gtc aca aga gaa caa ggc tct ttt gat tgg ttc aaa ggt	2498
Phe Tyr Trp Val Thr Arg Glu Gln Gly Ser Phe Asp Trp Phe Lys Gly	
815 820 825	
gtc atg aac gaa gtt gca gaa ctt gac caa cgg ggt gtg ata gag atg	2546
Val Met Asn Glu Val Ala Glu Leu Asp Gln Arg Gly Val Ile Glu Met	
830 835 840	
cat aac tat tta aca agt gtg tat gaa gaa ggt gat gct cgt tct gct	2594
His Asn Tyr Leu Thr Ser Val Tyr Glu Glu Gly Asp Ala Arg Ser Ala	
845 850 855 860	
ctc att aca atg gtt caa gct ctt aat cat gcc aaa aat ggt gtc gac	2642
Leu Ile Thr Met Val Gln Ala Leu Asn His Ala Lys Asn Gly Val Asp	
865 870 875	
att gtc tct ggc act agg gtc aga aca cac ttt gca aga cct aat tgg	2690
Ile Val Ser Gly Thr Arg Val Arg Thr His Phe Ala Arg Pro Asn Trp	
880 885 890	
aag aag gtt ctc aca aag cta agt tcc aag cat tgc aat gca aga aca	2738
Lys Lys Val Leu Thr Lys Leu Ser Ser Lys His Cys Asn Ala Arg Thr	
895 900 905	
gga gtg ttt tat tgc gga gta ccg gtt tta ggg aag gag ctt agc aaa	2786
Gly Val Phe Tyr Cys Gly Val Pro Val Leu Gly Lys Glu Leu Ser Lys	
910 915 920	
cta tgc aac aca ttc aat caa aaa ggt tca acc aag ttt gaa ttt cac	2834
Leu Cys Asn Thr Phe Asn Gln Lys Gly Ser Thr Lys Phe Glu Phe His	
925 930 935 940	
aag gag cat ttc taaaagacaa gaaggaagaa gccaaaagcc ctctagattc	2886
Lys Glu His Phe	
ttaatatct caaattttagc cacttatagt ataaaggcaa tctttcact atttaattca	2946
aagtgattaa acgttaaacac actgtcaaaa gtgagtgtgt taacgttttag ctccacacgt	3006
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ggtttgatag aagc	3080

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<211> 944

<212> PRT

<213> Arabidopsis thaliana

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35 40 45	
Asp Leu Gln Asp Asp Asp Thr Ile Val Leu Arg Ser Val Glu Pro Ala	
50 55 60	
Thr Ala Ile Asn Val Ile Gly Asp Ile Ser Asp Asp Asn Thr Gly Ile	
65 70 75 80	
Met Thr Pro Val Ser Ile Ser Arg Ser Pro Thr Met Lys Arg Thr Ser	
85 90 95	
Ser Asn Arg Phe Arg Gln Phe Ser Gln Glu Leu Lys Ala Glu Ala Val	
100 105 110	
Ala Lys Ala Lys Gln Leu Ser Gln Glu Leu Lys Arg Phe Ser Trp Ser	
115 120 125	
Arg Ser Phe Ser Gly Asn Leu Thr Thr Ser Thr Ala Ala Asn Gln	
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Ser Gly Gly Ala Gly Gly Leu Val Asn Ser Ala Leu Glu Ala Arg	

Sequence Listing

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					165					170					175	
	Gln	Arg	Ala	Leu	Arg	Gly	Leu	Arg	Phe	Ile	Ser	Asn	Lys	Gln	Lys	Asn
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															195	
	Val	Asp	Gly	Trp	Asn	Asp	Val	Gln	Ser	Asn	Phe	Glu	Lys	Phe	Glu	Lys
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																210
	Asn	Gly	Tyr	Ile	Tyr	Arg	Ser	Asp	Phe	Ala	Gln	Cys	Ile	Gly	Met	Lys
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																225
	Asp	Ser	Lys	Glu	Phe	Ala	Leu	Glu	Leu	Phe	Asp	Ala	Leu	Ser	Arg	Arg
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	Arg	Arg	Leu	Lys	Val	Glu	Lys	Ile	Asn	His	Asp	Glu	Leu	Tyr	Glu	Tyr
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																260
	Trp	Ser	Gln	Ile	Asn	Asp	Glu	Ser	Phe	Asp	Ser	Arg	Leu	Gln	Ile	Phe
										265				270		
																275
	Phe	Asp	Ile	Val	Asp	Lys	Asn	Glu	Asp	Gly	Arg	Ile	Thr	Glu	Glu	Glu
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																290
	Val	Lys	Glu	Ile	Ile	Met	Leu	Ser	Ala	Ser	Ala	Asn	Lys	Leu	Ser	Arg
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																305
	Leu	Lys	Glu	Gln	Ala	Glu	Glu	Tyr	Ala	Ala	Leu	Ile	Met	Glu	Glu	Leu
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	Asp	Pro	Glu	Arg	Leu	Gly	Tyr	Ile	Glu	Leu	Trp	Gln	Leu	Glu	Thr	Leu
										325		330			335	
																340
	Leu	Leu	Gln	Lys	Asp	Thr	Tyr	Leu	Asn	Tyr	Ser	Gln	Ala	Leu	Ser	Tyr
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	Thr	Ser	Gln	Ala	Leu	Ser	Gln	Asn	Leu	Gln	Gly	Leu	Arg	Gly	Lys	Ser
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																370
	Arg	Ile	His	Arg	Met	Ser	Ser	Asp	Phe	Val	Tyr	Ile	Met	Gln	Glu	Asn
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																385
	Trp	Lys	Arg	Ile	Trp	Val	Leu	Ser	Leu	Trp	Ile	Met	Ile	Met	Ile	Gly
										390			395			400
	Leu	Phe	Leu	Trp	Lys	Phe	Phe	Gln	Tyr	Lys	Gln	Lys	Asp	Ala	Phe	His
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																425
	Lys	Phe	Asn	Met	Ala	Leu	Ile	Leu	Phe	Pro	Val	Cys	Arg	Asn	Thr	Ile
										435		440			445	
																435
	Thr	Trp	Leu	Arg	Ser	Thr	Arg	Leu	Ser	Tyr	Phe	Val	Pro	Phe	Asp	Asp
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	Asn	Ile	Asn	Phe	His	Lys	Thr	Ile	Ala	Gly	Ala	Ile	Val	Val	Ala	Val
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																480
	Ile	Leu	His	Ile	Gly	Asp	His	Leu	Ala	Cys	Asp	Phe	Pro	Arg	Ile	Val
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	Thr	Lys	Gln	Pro	Thr	Tyr	Phe	Asp	Leu	Val	Lys	Gly	Pro	Glu	Gly	Ile
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	Thr	Gly	Ile	Leu	Met	val	Ile	Leu	Met	Ile	Ile	Ser	Phe	Thr	Leu	Ala
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	Arg	Leu	Thr	Gly	Phe	Asn	Ala	Phe	Trp	Tyr	Ser	His	His	Leu	Phe	Val
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	Ile	Val	Tyr	Ile	Leu	Leu	Ile	Leu	His	Gly	Ile	Phe	Leu	Tyr	Phe	Ala
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	Lys	Pro	Trp	Tyr	Val	Arg	Thr	Thr	Trp	Met	Tyr	Leu	Ala	Val	Pro	Val
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	Leu	Leu	Tyr	Gly	Gly	Glu	Arg	Thr	Leu	Arg	Tyr	Phe	Arg	Ser	Gly	Ser
										610		615			620	
	Tyr	Ser	Val	Arg	Leu	Leu	Lys	Val	Ala	Ile	Tyr	Pro	Gly	Asn	Val	Leu
										625		630			635	
																640
	Thr	Leu	Gln	Met	Ser	Lys	Pro	Thr	Gln	Phe	Arg	Tyr	Lys	Ser	Gly	Gln
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Sequence Listing

Tyr Met Phe Val Gln Cys Pro Ala Val Ser Pro Phe Glu Trp His Pro
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 Phe Ser Ile Thr Ser Ala Pro Glu Asp Asp Tyr Ile Ser Ile His Ile
 675 680 685
 Arg Gln Leu Gly Asp Trp Thr Gln Glu Leu Lys Arg Val Phe Ser Glu
 690 695 700
 Val Cys Glu Pro Pro Val Gly Gly Lys Ser Gly Leu Leu Arg Ala Asp
 705 710 715 720
 Glu Thr Thr Lys Lys Ser Leu Pro Lys Leu Leu Ile Asp Gly Pro Tyr
 725 730 735
 Gly Ala Pro Ala Gln Asp Tyr Arg Lys Tyr Asp Val Leu Leu Val
 740 745 750
 Gly Leu Gly Ile Gly Ala Thr Pro Phe Ile Ser Ile Leu Lys Asp Leu
 755 760 765
 Leu Asn Asn Ile Val Lys Met Glu Glu His Ala Asp Ser Ile Ser Asp
 770 775 780
 Phe Ser Arg Ser Ser Glu Tyr Ser Thr Gly Ser Asn Gly Asp Thr Pro
 785 790 795 800
 Arg Arg Lys Arg Ile Leu Lys Thr Thr Asn Ala Tyr Phe Tyr Trp Val
 805 810 815
 Thr Arg Glu Gln Gly Ser Phe Asp Trp Phe Lys Gly Val Met Asn Glu
 820 825 830
 Val Ala Glu Leu Asp Gln Arg Gly Val Ile Glu Met His Asn Tyr Leu
 835 840 845
 Thr Ser Val Tyr Glu Glu Gly Asp Ala Arg Ser Ala Leu Ile Thr Met
 850 855 860
 Val Gln Ala Leu Asn His Ala Lys Asn Gly Val Asp Ile Val Ser Gly
 865 870 875 880
 Thr Arg Val Arg Thr His Phe Ala Arg Pro Asn Trp Lys Lys Val Leu
 885 890 895
 Thr Lys Leu Ser Ser Lys His Cys Asn Ala Arg Thr Gly Val Phe Tyr
 900 905 910
 Cys Gly Val Pro Val Leu Gly Lys Glu Leu Ser Lys Leu Cys Asn Thr
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<222> (132)..(2894)

<223> coding for NADPH oxidase

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 tCTCGAATTc g atg aaa atg aga cga ggc aat tca aGT aac gac cat gaa 170
 Met Lys Met Arg Arg Gly Asn Ser Ser Asn Asp His Glu
 1 5 10

ctt ggg att cta cga gga gct aac tcg gac acc aac tcg gac acg gag 218
 Leu Gly Ile Leu Arg Gly Ala Asn Ser Asp Thr Asn Ser Asp Thr Glu
 15 20 25

agc atc gct agc gac cgt ggt gcc ttt agc ggt ccg ctt ggc cgg cct 266
 Ser Ile Ala Ser Asp Arg Gly Ala Phe Ser Gly Pro Leu Gly Arg Pro
 30 35 40 45

aaa cgt gcg tcc aag aaa aac gca aga ttc gcc gac gat ctt ccc aag 314
 Lys Arg Ala Ser Lys Lys Asn Ala Arg Phe Ala Asp Asp Leu Pro Lys
 50 55 60

aga agc aat agt gtt gct ggc ggc cgt ggt gat gac gat gag tac gtg 362
 Arg Ser Asn Ser Val Ala Gly Gly Arg Gly Asp Asp Asp Glu Tyr Val
 65 70 75

Sequence Listing

gag atc acg cta gac atc agg gac gac tcg gtg gcc gtc cat agt gtc	410
Glu Ile Thr Leu Asp Ile Arg Asp Asp Ser Val Ala Val His Ser Val	
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caa caa gca gct gga ggt gga ggc cac ctg gag gac ccg gag cta gcc	458
Gln Gln Ala Ala Gly Gly His Leu Glu Asp Pro Glu Leu Ala	
95 100 105	
ctt ctt acg aag aag act ctc gag agc agc ctc aac aac acc acc tcc	506
Leu Leu Thr Lys Lys Thr Leu Glu Ser Ser Leu Asn Asn Thr Thr Ser	
110 115 120 125	
tta tct ttc ttc cga agc acc tcc tca cgc atc aag aac gcc tcc cgc	554
Leu Ser Phe Phe Arg Ser Thr Ser Arg Ile Lys Asn Ala Ser Arg	
130 135 140	
gag ctc cgc cgc gtg ttc tct aga cgt ccc tcc ccg gcc gtg cgg cgg	602
Glu Leu Arg Arg Val Phe Ser Arg Arg Pro Ser Pro Ala Val Arg Arg	
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Phe Asp Arg Thr Ser Ser Ala Ala Ile His Ala Leu Lys Gly Leu Lys	
160 165 170	
ttc att gcc acc aag acg gcc gca tgg ccg gcc gtc gac caa cgt ttc	698
Phe Ile Ala Thr Lys Thr Ala Ala Trp Pro Ala Val Asp Gln Arg Phe	
175 180 185	
gat aaa ctc tcc gct gat tcc aac ggc ctc tta ctc tct gcc aag ttt	746
Asp Lys Leu Ser Ala Asp Ser Asn Gly Leu Leu Leu Ser Ala Lys Phe	
190 195 200 205	
tgg gaa tgc tta gga atg aat aag gaa tct aaa gac ttc gct gac cag	794
Trp Glu Cys Leu Gly Met Asn Lys Glu Ser Lys Asp Phe Ala Asp Gln	
210 215 220	
ctc ttt aga gca tta gct cgc cgg aat aac gtc tcc ggc gat gca atc	842
Leu Phe Arg Ala Leu Ala Arg Arg Asn Asn Val Ser Gly Asp Ala Ile	
225 230 235	
aca aag gaa cag ctt agg ata ttc tgg gaa cag atc tca gac gaa agc	890
Thr Lys Glu Gln Leu Arg Ile Phe Trp Glu Gln Ile Ser Asp Glu Ser	
240 245 250	
ttt gat gcc aaa ctc caa gtc ttt ttt gac atg gtg gac aaa gat gaa	938
Phe Asp Ala Lys Leu Gln Val Phe Phe Asp Met Val Asp Lys Asp Glu	
255 260 265	
gat ggg cga gta aca gaa gaa gag gtg gct gag att att agt ctt agt	986
Asp Gly Arg Val Thr Glu Glu Glu Val Ala Glu Ile Ile Ser Leu Ser	
270 275 280 285	
gct tct gca aac aag ctc tca aat att caa aag caa gcc aaa gaa tat	1034
Ala Ser Ala Asn Lys Leu Ser Asn Ile Gln Lys Gln Ala Lys Glu Tyr	
290 295 300	
gcg gca ctg ata atg gaa gag ttg gac cca gac aat gct ggg ttt att	1082
Ala Ala Leu Ile Met Glu Glu Leu Asp Pro Asp Asn Ala Gly Phe Ile	
305 310 315	
atg atc gaa aac ttg gaa atg ttg cta tta caa gca ccg aac cag tcg	1130
Met Ile Glu Asn Leu Glu Met Leu Leu Leu Gln Ala Pro Asn Gln Ser	
320 325 330	
gtg cgg atg gga gac agc agg ata ctt agt cag atg tta agt cag aag	1178
Val Arg Met Gly Asp Ser Arg Ile Leu Ser Gln Met Leu Ser Gln Lys	
335 340 345	
ctt aga ccg gca aaa gag agc aac cct tta ttg aga tgg tcg gag aaa	1226
Leu Arg Pro Ala Lys Glu Ser Asn Pro Leu Leu Arg Trp Ser Glu Lys	
350 355 360 365	
atc aaa tat ttc ata ctt gat aat tgg cag aga tta tgg atc atg atg	1274
Ile Lys Tyr Phe Ile Leu Asp Asn Trp Gln Arg Leu Trp Ile Met Met	
370 375 380	
tta tgg ctt ggc atc tgt ggt ggc ctc ttt act tat aaa ttc att cag	1322
Leu Trp Leu Gly Ile Cys Gly Gly Leu Phe Thr Tyr Lys Phe Ile Gln	
385 390 395	
tac aag aac aaa gct gcc tat ggt gtg atg ggt tat tgt gtt tgt gtc	1370
Tyr Lys Asn Lys Ala Ala Tyr Gly Val Met Gly Tyr Cys Val Cys Val	
400 405 410	

Sequence Listing

gcc	aaa	gga	ggc	gcc	gag	act	ctc	aaa	ttc	aac	atg	gct	ctc	ata	ttg		1418
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ttg	cct	gtt	tgt	cga	aac	acc	atc	act	tgg	ctt	agg	aac	aag	acc	aag		1466
Leu	Pro	Val	Cys	Arg	Asn	Thr	Ile	Thr	Trp	Leu	Arg	Asn	Lys	Thr	Lys		
430						435				440			445				
ctt	ggt	act	gtc	gtt	cct	ttt	gat	gat	agt	ctt	aac	ttc	cac	aag	gtt		1514
Leu	Gly	Thr	Val	Val	Pro	Phe	Asp	Asp	Ser	Leu	Asn	Phe	His	Lys	Val		
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Ile	Ala	Ser	Gly	Ile	Val	Val	Gly	Val	Leu	Leu	His	Ala	Gly	Ala	His		
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tta	acg	tgt	gat	ttt	cca	cgt	tta	att	gcc	gct	gat	gag	gac	acc	tat		1610
Leu	Thr	Cys	Asp	Phe	Pro	Arg	Leu	Ile	Ala	Ala	Asp	Glu	Asp	Thr	Tyr		
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gag	ccg	atg	gaa	aaa	tac	ttt	ggg	gat	caa	ccg	act	agc	tac	tgg	tgg		1658
Glu	Pro	Met	Glu	Lys	Tyr	Phe	Gly	Asp	Gln	Pro	Thr	Ser	Tyr	Trp	Trp		
						495			500			505					
ttt	gtg	aaa	gga	gtg	gaa	gga	tgg	act	ggc	att	gtg	atg	gtt	gtg	cta		1706
Phe	Val	Lys	Gly	Val	Glu	Gly	Trp	Thr	Gly	Ile	Val	Met	Val	Val	Leu		
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Met	Ala	Ile	Ala	Phe	Thr	Leu	Ala	Thr	Pro	Trp	Phe	Arg	Arg	Asn	Lys		
						530			535			540					
ctt	aac	tta	cct	aac	ttc	ctc	aag	aag	ctt	acc	ggt	ttc	aac	gcc	ttt		1802
Leu	Asn	Leu	Pro	Asn	Phe	Leu	Lys	Lys	Leu	Thr	Gly	Phe	Asn	Ala	Phe		
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tgg	tac	acc	cac	cat	ttg	ttc	atc	att	gtt	tat	gct	ctt	ctc	att	gtc		1850
Trp	Tyr	Thr	His	His	Leu	Phe	Ile	Ile	Val	Tyr	Ala	Leu	Leu	Ile	Val		
						560			565			570					
cat	gtt	atc	aag	ctc	tac	ctc	aca	aag	att	tgg	tat	cag	aag	acg	aca		1898
His	Gly	Ile	Lys	Leu	Tyr	Leu	Thr	Lys	Ile	Trp	Tyr	Gln	Lys	Thr	Thr		
						575			580			585					
tgg	atg	tat	ctt	gct	gta	ccc	atc	ctt	cta	tat	gca	tct	gag	agg	ctg		1946
Trp	Met	Tyr	Leu	Ala	Val	Pro	Ile	Leu	Leu	Tyr	Ala	Ser	Glu	Arg	Leu		
						590			595			600			605		
ctc	cgt	gct	ttc	aga	tca	agc	atc	aaa	ccg	gtt	aag	atg	atc	aag	gtg		1994
Leu	Arg	Ala	Phe	Arg	Ser	Ser	Ile	Lys	Pro	Val	Lys	Met	Ile	Lys	Val		
						610			615			620					
gct	gtt	tac	ccc	ggg	aac	gtg	ttg	tct	cta	cac	atg	acg	aag	cca	caa		2042
Ala	Val	Tyr	Pro	Gly	Asn	Val	Leu	Ser	Leu	His	Met	Thr	Lys	Pro	Gln		
						625			630			635					
gga	ttc	aaa	tac	aaa	agt	gga	cag	ttc	atg	ttg	gtg	aac	tgc	cga	gcc		2090
Gly	Phe	Lys	Tyr	Lys	Ser	Gly	Gln	Phe	Met	Leu	Val	Asn	Cys	Arg	Ala		
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gta	tct	cca	tcc	gaa	tgg	cat	cct	tcc	tca	atc	aca	tca	gct	ccc	gga		2138
Val	Ser	Pro	Phe	Glu	Trp	His	Pro	Phe	Ser	Ile	Thr	Ser	Ala	Pro	Gly		
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gac	gat	tac	ctg	agc	gta	cat	atc	cgc	act	ctc	ggt	gac	tgg	aca	cgt		2186
Asp	Asp	Tyr	Leu	Ser	Val	His	Ile	Arg	Thr	Leu	Gly	Asp	Trp	Thr	Arg		
						670			675			680			685		
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Lys	Leu	Arg	Thr	Val	Phe	Ser	Glu	Val	Cys	Lys	Pro	Pro	Thr	Ala	Gly		
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aaa	agc	ggt	ctt	ctc	cga	gca	gac	gga	gga	gat	gga	aac	ctc	ccg	tcc		2282
Lys	Ser	Gly	Leu	Leu	Arg	Ala	Asp	Gly	Gly	Asp	Gly	Asn	Leu	Pro	Phe		
						705			710			715					
ccg	aag	gtc	ctt	atc	gac	ggt	cca	tac	ggt	gct	ccc	gca	caa	gac	tac		2330
Pro	Lys	Val	Leu	Ile	Asp	Gly	Pro	Tyr	Gly	Ala	Pro	Ala	Gln	Asp	Tyr		
						720			725			730					
aag	aaa	tac	gac	gtg	gta	ctc	ctc	gta	ggt	ctc	ggc	att	gga	gcc	acg		2378
Lys	Lys	Tyr	Asp	Val	Val	Leu	Leu	Val	Gly	Leu	Gly	Ile	Gly	Ala	Thr		
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Sequence Listing

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Ser Asp Arg Gly Ala Phe Ser Gly Pro Leu Gly Arg Pro Lys Arg Ala
   35          40          45
Ser Lys Lys Asn Ala Arg Phe Ala Asp Asp Leu Pro Lys Arg Ser Asn
   50          55          60
Ser Val Ala Gly Gly Arg Gly Asp Asp Asp Glu Tyr Val Glu Ile Thr
   65          70          75          80
Leu Asp Ile Arg Asp Asp Ser Val Ala Val His Ser Val Gln Gln Ala
   85          90          95
Ala Gly Gly Gly Gly His Leu Glu Asp Pro Glu Leu Ala Leu Leu Thr
   100         105         110
Lys Lys Thr Leu Glu Ser Ser Leu Asn Asn Thr Thr Ser Leu Ser Phe
   115         120         125
Phe Arg Ser Thr Ser Ser Arg Ile Lys Asn Ala Ser Arg Glu Leu Arg
   130         135         140
Arg Val Phe Ser Arg Arg Pro Ser Pro Ala Val Arg Arg Phe Asp Arg
   145         150         155         160
Thr Ser Ser Ala Ala Ile His Ala Leu Lys Gly Leu Lys Phe Ile Ala
   165         170         175

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Sequence Listing

Thr Lys Thr Ala Ala Trp Pro Ala Val Asp Gln Arg Phe Asp Lys Leu
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 Ser Ala Asp Ser Asn Gly Leu Leu Leu Ser Ala Lys Phe Trp Glu Cys
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 Leu Gly Met Asn Lys Glu Ser Lys Asp Phe Ala Asp Gln Leu Phe Arg
 210 215 220
 Ala Leu Ala Arg Arg Asn Asn Val Ser Gly Asp Ala Ile Thr Lys Glu
 225 230 235 240
 Gln Leu Arg Ile Phe Trp Glu Gln Ile Ser Asp Glu Ser Phe Asp Ala
 245 250 255
 Lys Leu Gln Val Phe Phe Asp Met Val Asp Lys Asp Glu Asp Gly Arg
 260 265 270
 Val Thr Glu Glu Glu Val Ala Glu Ile Ile Ser Leu Ser Ala Ser Ala
 275 280 285
 Asn Lys Leu Ser Asn Ile Gln Lys Gln Ala Lys Glu Tyr Ala Ala Leu
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 305 310 315 320
 Asn Leu Glu Met Leu Leu Leu Gln Ala Pro Asn Gln Ser Val Arg Met
 325 330 335
 Gly Asp Ser Arg Ile Leu Ser Gln Met Leu Ser Gln Lys Leu Arg Pro
 340 345 350
 Ala Lys Glu Ser Asn Pro Leu Leu Arg Trp Ser Glu Lys Ile Lys Tyr
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 Phe Ile Leu Asp Asn Trp Gln Arg Leu Trp Ile Met Met Leu Trp Leu
 370 375 380
 Gly Ile Cys Gly Gly Leu Phe Thr Tyr Lys Phe Ile Gln Tyr Lys Asn
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 Lys Ala Ala Tyr Gly Val Met Gly Tyr Cys Val Cys Val Ala Lys Gly
 405 410 415
 Gly Ala Glu Thr Leu Lys Phe Asn Met Ala Leu Ile Leu Leu Pro Val
 420 425 430
 Cys Arg Asn Thr Ile Thr Trp Leu Arg Asn Lys Thr Lys Leu Gly Thr
 435 440 445
 Val Val Pro Phe Asp Asp Ser Leu Asn Phe His Lys Val Ile Ala Ser
 450 455 460
 Gly Ile Val Val Gly Val Leu Leu His Ala Gly Ala His Leu Thr Cys
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 Asp Phe Pro Arg Leu Ile Ala Ala Asp Glu Asp Thr Tyr Glu Pro Met
 485 490 495
 Glu Lys Tyr Phe Gly Asp Gln Pro Thr Ser Tyr Trp Trp Phe Val Lys
 500 505 510
 Gly Val Glu Gly Trp Thr Gly Ile Val Met Val Val Leu Met Ala Ile
 515 520 525
 Ala Phe Thr Leu Ala Thr Pro Trp Phe Arg Arg Asn Lys Leu Asn Leu
 530 535 540
 Pro Asn Phe Leu Lys Leu Thr Gly Phe Asn Ala Phe Trp Tyr Thr
 545 550 555 560
 His His Leu Phe Ile Ile Val Tyr Ala Leu Leu Ile Val His Gly Ile
 565 570 575
 Lys Leu Tyr Leu Thr Lys Ile Trp Tyr Gln Lys Thr Thr Trp Met Tyr
 580 585 590
 Leu Ala Val Pro Ile Leu Leu Tyr Ala Ser Glu Arg Leu Leu Arg Ala
 595 600 605
 Phe Arg Ser Ser Ile Lys Pro Val Lys Met Ile Lys Val Ala Val Tyr
 610 615 620
 Pro Gly Asn Val Leu Ser Leu His Met Thr Lys Pro Gln Gly Phe Lys
 625 630 635 640
 Tyr Lys Ser Gly Gln Phe Met Leu Val Asn Cys Arg Ala Val Ser Pro
 645 650 655
 Phe Glu Trp His Pro Phe Ser Ile Thr Ser Ala Pro Gly Asp Asp Tyr
 660 665 670
 Leu Ser Val His Ile Arg Thr Leu Gly Asp Trp Thr Arg Lys Leu Arg

Sequence Listing

675	680	685
Thr Val Phe Ser Glu Val Cys Lys Pro Pro Thr Ala Gly Lys Ser Gly		
690	695	700
Leu Leu Arg Ala Asp Gly Gly Asp Gly Asn Leu Pro Phe Pro Lys Val		
705	710	715
Leu Ile Asp Gly Pro Tyr Gly Ala Pro Ala Gln Asp Tyr Lys Lys Tyr		
725	730	735
Asp Val Val Leu Leu Val Gly Leu Gly Ile Gly Ala Thr Pro Met Ile		
740	745	750
Ser Ile Leu Lys Asp Ile Ile Asn Asn Met Lys Gly Pro Asp Arg Asp		
755	760	765
Ser Asp Ile Glu Asn Asn Ser Asn Asn Asn Ser Lys Gly Phe Lys		
770	775	780
Thr Arg Lys Ala Tyr Phe Tyr Trp Val Thr Arg Glu Gln Gly Ser Phe		
785	790	795
Glu Trp Phe Lys Gly Ile Met Asp Glu Ile Ser Glu Leu Asp Glu Glu		
805	810	815
Gly Ile Ile Glu Leu His Asn Tyr Cys Thr Ser Val Tyr Glu Glu Gly		
820	825	830
Asp Ala Arg Val Ala Leu Ile Ala Met Leu Gln Ser Leu Gln His Ala		
835	840	845
Lys Asn Gly Val Asp Val Val Ser Gly Thr Arg Val Lys Ser His Phe		
850	855	860
Ala Lys Pro Asn Trp Arg Gln Val Tyr Lys Ile Ala Val Gln His		
865	870	875
Pro Gly Lys Arg Ile Gly Val Phe Tyr Cys Gly Met Pro Gly Met Ile		
885	890	895
Lys Glu Leu Lys Asn Leu Ala Leu Asp Phe Ser Arg Lys Thr Thr Thr		
900	905	910
Lys Phe Asp Phe His Lys Glu Asn Phe		
915	920	

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<220>
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<223> coding for NADPH oxidase
<400> 15

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ataccaatta ttaatcttt gtcatcttt tccttctcgc gttcatatat actggaatat 180
acatctttt ttcaacctat cttctttcat tttcaagaat tcgggttcca taaatagtag 240
gttcactact tttatttcaa cctccctaaa gtttatttcat tcatatttt tctcaaagaa 300
aaaactataaa aa atg caa aat tcg gaa aat cat cat ccg cac cac cag cac 351
Met Gln Asn Ser Glu Asn His His Pro His His Gln His
      1          5          10
cac cat tcg gac aca gag ata att gga aat gat aga gcg tcg tac agt 399
His His Ser Asp Thr Glu Ile Ile Gly Asn Asp Arg Ala Ser Tyr Ser
      15         20         25
ggt ccg tta agc gga ccg tta aac aaa cga ggc ggc aaa aag agt gcg 447
Gly Pro Leu Ser Gly Pro Leu Asn Lys Arg Gly Gly Lys Ser Ala
      30         35         40         45
aga ttt aac att cct gaa tct acc gac atc gga acc agt gtc gga acc 495
Arg Phe Asn Ile Pro Glu Ser Thr Asp Ile Gly Thr Ser Val Gly Thr
      50         55         60
ggc ggc aag tcc aat gat gat gcg tac gtt gaa atc act ctc gat gtc 543
Gly Gly Lys Ser Asn Asp Asp Ala Tyr Val Glu Ile Thr Leu Asp Val
      65         70         75
cgc gaa gat tcc gtc gct gtc cac agt gtc aaa act gcc ggc ggt gat 591
Arg Glu Asp Ser Val Ala Val His Ser Val Lys Thr Ala Gly Gly Asp

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Sequence Listing

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Asp	Val	Glu	Asp	Pro	Glu	Leu	Ala	Leu	Leu	Ala	Lys	Gly	Leu	Glu	Lys	
95					100					105						
aag	tcc	act	tta	gga	tct	tca	ctt	gtt	cga	aat	gct	tcg	tct	aga	att	687
Lys	Ser	Thr	Leu	Gly	Ser	Ser	Leu	Val	Arg	Asn	Ala	Ser	Ser	Arg	Ile	
110					115					120					125	
cgg	caa	gtg	tca	caa	gag	ctc	agg	cgt	ttg	gct	tcc	tta	aat	aaa	cgc	735
Arg	Gln	Val	Ser	Gln	Glu	Leu	Arg	Arg	Leu	Ala	Ser	Leu	Asn	Lys	Arg	
					130					135				140		
cca	att	cct	act	gga	agg	tcc	gac	agg	aat	aaa	tca	gct	gct	gct	cat	783
Pro	Ile	Pro	Thr	Gly	Arg	Phe	Asp	Arg	Asn	Lys	Ser	Ala	Ala	Ala	His	
					145					150				155		
gct	ctt	aaa	ggt	ctc	aag	ttt	att	agt	aag	acc	gac	ggc	ggc	gct	ggt	831
Ala	Leu	Lys	Gly	Leu	Lys	Phe	Ile	Ser	Lys	Thr	Asp	Gly	Gly	Ala	Gly	
					160					165				170		
tgg	gcc	gcc	gtc	gag	aag	cgg	tcc	gat	gag	att	act	gct	tct	act	act	879
Trp	Ala	Ala	Val	Glu	Lys	Arg	Phe	Asp	Glu	Ile	Thr	Ala	Ser	Thr	Thr	
					175					180				185		
ggt	ttg	ctt	cct	cgt	gcc	aaa	ttt	gga	gaa	tgt	ata	ggt	atg	aat	aag	927
Gly	Leu	Leu	Pro	Arg	Ala	Lys	Phe	Gly	Glu	Cys	Ile	Gly	Met	Asn	Lys	
					190					195				200		205
gag	tct	aag	gaa	ttt	gct	gtt	gag	cta	tat	gat	gcg	cta	gct	cgg	agg	975
Glu	Ser	Lys	Glu	Phe	Ala	Val	Glu	Leu	Tyr	Asp	Ala	Leu	Ala	Arg	Arg	
					210					215				220		
aga	aac	att	aca	act	gat	tcc	att	aac	aaa	gca	cag	ctc	aaa	gag	ttc	1023
Arg	Asn	Ile	Thr	Asp	Ser	Ile	Asn	Lys	Ala	Gln	Leu	Lys	Glu	Phe		
					225					230				235		
tgg	gac	caa	gtg	gct	gac	caa	agt	ttt	gat	tct	cgc	ctt	caa	aca	ttt	1071
Trp	Asp	Gln	Val	Ala	Asp	Gln	Ser	Phe	Asp	Ser	Arg	Leu	Gln	Thr	Phe	
					240					245				250		
ttt	gac	atg	gtt	gat	aaa	gat	gct	gat	ggt	aga	att	aca	gaa	gaa	gaa	1119
Phe	Asp	Met	Val	Asp	Lys	Asp	Ala	Asp	Gly	Arg	Ile	Thr	Glu	Glu	Glu	
					255					260				265		
gtc	aga	gag	att	ata	ggc	ctt	agc	gcg	tcg	gcc	aac	agg	ctg	tca	aca	1167
Val	Arg	Glu	Ile	Ile	Gly	Leu	Ser	Ala	Ser	Ala	Asn	Arg	Leu	Ser	Thr	
					270					275				280		285
atc	cag	aaa	caa	gct	gat	gaa	tac	gca	gca	atg	atc	atg	gaa	gag	ttg	1215
Ile	Gln	Lys	Gln	Ala	Asp	Glu	Tyr	Ala	Ala	Met	Ile	Met	Glu	Glu	Leu	
					290					295				300		
gat	cct	aac	aac	ctc	gga	tac	att	atg	att	gag	aac	ttg	gaa	atg	ctt	1263
Asp	Pro	Asn	Asn	Leu	Gly	Tyr	Ile	Met	Ile	Glu	Asn	Leu	Glu	Met	Leu	
					305					310				315		
tta	ctg	caa	gca	cca	aat	caa	tca	gtg	caa	aga	gga	ggc	gaa	agt	cgg	1311
Leu	Leu	Gln	Ala	Pro	Asn	Gln	Ser	Val	Gln	Arg	Gly	Gly	Glu	Ser	Arg	
					320					325				330		
aac	ttg	agt	caa	atg	cta	agt	caa	aaa	cta	aag	cat	aca	caa	gag	aga	1359
Asn	Leu	Ser	Gln	Met	Leu	Ser	Gln	Lys	Leu	Lys	His	Thr	Gln	Glu	Arg	
					335					340				345		
aat	cca	ata	gta	aga	tgg	tac	aag	agt	ttc	atg	tac	ttt	ttg	ctg	gat	1407
Asn	Pro	Ile	Val	Arg	Trp	Tyr	Lys	Ser	Phe	Met	Tyr	Phe	Leu	Leu	Asp	
					350					355				360		365
aat	tgg	caa	aga	gtt	tgg	gta	ttg	tta	ctg	tgg	att	gga	att	atg	gct	1455
Asn	Trp	Gln	Arg	Val	Trp	Val	Leu	Leu	Leu	Trp	Ile	Gly	Ile	Met	Ala	
					370					375				380		
ggt	cta	ttt	aca	tgg	aaa	tat	ata	cag	tat	aaa	gaa	aaa	gct	gca	tat	1503
Gly	Leu	Phe	Thr	Trp	Lys	Tyr	Ile	Gln	Tyr	Lys	Glu	Lys	Ala	Ala	Tyr	
					385					390				395		
aaa	gtc	atg	ggt	ccc	tgt	gtg	tgt	ttt	gcc	aaa	ggt	gct	gct	gaa	aca	1551
Lys	Val	Met	Gly	Pro	Cys	Val	Cys	Phe	Ala	Lys	Gly	Ala	Ala	Glu	Thr	
					400					405				410		
ctc	aag	ctc	aac	atg	gca	att	att	tta	ttt	ccg	gtt	tgc	aga	aac	acg	1599
Leu	Lys	Leu	Asn	Met	Ala	Ile	Ile	Leu	Phe	Pro	Val	Cys	Arg	Asn	Thr	

Sequence Listing

415	420	425	
atc aca tgg ctt cga aat aag acc aga tta ggt gct gct gtt cct ctt			
Ile Thr Trp Leu Arg Asn Lys Thr Arg Leu Gly Ala Ala Val Pro Phe			1647
430	435	440	445
gat gat aac ctt aat ttt cac aaa gtg ata gca gtc gca att gct ctt			
Asp Asp Asn Leu Asn Phe His Lys Val Ile Ala Val Ala Ile Ala Leu			1695
450	455	460	
ggg gtt gga ata cac gga cta tct cac ttg aca tgt gat ttt cct cgg			
Gly Val Gly Ile His Gly Leu Ser His Leu Thr Cys Asp Phe Pro Arg			1743
465	470	475	
ctt tta aat gct agt gaa gaa gaa tat gaa cca atg aag tac tat ttt			
Leu Leu Asn Ala Ser Glu Glu Glu Tyr Glu Pro Met Lys Tyr Tyr Phe			1791
480	485	490	
gga gat cag cca gaa agc tat tgg tgg ttt ata aaa gga gta gaa ggg			
Gly Asp Gln Pro Glu Ser Tyr Trp Trp Phe Ile Lys Gly Val Glu Gly			1839
495	500	505	
gta act gga att ata atg gtt gtt tta atg gca ata gca ttt act cta			
Val Thr Gly Ile Ile Met Val Val Leu Met Ala Ile Ala Phe Thr Leu			1887
510	515	520	525
gca acc cca tgg ttt aga agg aat aga gtt agt ttg cca aaa cca ttt			
Ala Thr Pro Trp Phe Arg Arg Asn Arg Val Ser Leu Pro Lys Pro Phe			1935
530	535	540	
cac aaa ctc act gga tnt aat gcc ttt tgg tac tct cac cat ctc ttt			
His Lys Leu Thr Gly Xaa Asn Ala Phe Trp Tyr Ser His His Leu Phe			1983
545	550	555	
gtt atc gtc tac act ctg ttc att gtg cat ggt gaa aag cta tac att			
Val Ile Val Tyr Thr Leu Phe Ile Val His Gly Glu Lys Leu Tyr Ile			2031
560	565	570	
acc aaa gat tgg tac aag aga acc gac atg gat gta ctt tta act atc			
Thr Lys Asp Trp Tyr Lys Arg Thr Asp Met Asp Val Leu Leu Thr Ile			2079
575	580	585	
cca atc ata ctc tat gct agt gaa agg ttg att agg gca ttc agg tca			
Pro Ile Ile Leu Tyr Ala Ser Glu Arg Leu Ile Arg Ala Phe Arg Ser			2127
590	595	600	605
agc att aaa gct gtt aag att ttg aag gtc gca gta tat cca gga aat			
Ser Ile Lys Ala Val Lys Ile Leu Lys Val Ala Val Tyr Pro Gly Asn			2175
610	615	620	
gtg ttg gca ctt cac atg tca aaa cca cag ggc tac aaa tac aaa agt			
Val Leu Ala Leu His Met Ser Lys Pro Gln Gly Tyr Lys Tyr Lys Ser			2223
625	630	635	
ggg caa tac atg ttt gtc aac tgt gct gca gtt tct cca ttt gag tgg			
Gly Gln Tyr Met Phe Val Asn Cys Ala Ala Val Ser Pro Phe Glu Trp			2271
640	645	650	
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His Pro Phe Ser Ile Thr Ser Ala Pro Gly Asp Asp Tyr Leu Ser Val			2319
655	660	665	
cat att cga act ctt ggt gat tgg acc aggcaa ctt aaa act gtt ttc			
His Ile Arg Thr Leu Gly Asp Trp Thr Arg Gln Leu Lys Thr Val Phe			2367
670	675	680	685
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Ser Glu Val Cys Gln Pro Pro Asn Gly Lys Ser Gly Leu Leu Arg			2415
690	695	700	
gct gac tac ttg caa gga gag aat aat cct aat ttc cca agg gtc tta			
Ala Asp Tyr Leu Gln Gly Glu Asn Asn Pro Asn Phe Pro Arg Val Leu			2463
705	710	715	
ata gat gga cca tat gga gca cca gaa gac tac aag aaa tat gag			
Ile Asp Gly Pro Tyr Gly Ala Pro Ala Gln Asp Tyr Lys Lys Tyr Glu			2511
720	725	730	
gtg gtt ttg ttg gta ggt ctt gga att gga gct aca cca atg atc agt			
Val Val Leu Leu Val Gly Leu Gly Ile Gly Ala Thr Pro Met Ile Ser			2559
735	740	745	
att gtt aaa gac att gtc aac aac atg aag gca atg gac gaa gaa gaa			
Ile Val Lys Asp Ile Val Asn Asn Met Lys Ala Met Asp Glu Glu Glu			2607

Sequence Listing

750	755	760	765	2655
aat tcc ttg gaa gat	gga cac aat aat atg	gca cca aat tct	agc	
Asn Ser Leu Glu Asp	Gly His Asn Asn Asn	Met Ala Pro Asn	Ser Ser	
770	775	780		
ccc aat att gca aaa aat aag ggt	aat aaa tca ggt tca	gca agt gga		2703
Pro Asn Ile Ala Lys Asn Lys Gly	Asn Lys Ser Gly	Ser Ala Ser Gly		
785	790	795		
gga aat aat ttc aat aca agg aga	gca tat ttc tat tgg	gtt act aga		2751
Gly Asn Asn Phe Asn Thr Arg	Arg Ala Tyr Phe Tyr	Trp Val Thr Arg		
800	805	810		
gaa caa ggt tca ttt gat	tgg ttc aaa ggt ata atg	aat gaa gct gct		2799
Glu Gln Gly Ser Phe Asp	Trp Phe Lys Gly Ile	Met Asn Glu Ala Ala		
815	820	825		
gaa atg gac cat aag gga gta	att gaa atg cat aat	tat tgt act agt		2847
Glu Met Asp His Lys Gly Val	Ile Glu Met His Asn	Tyr Cys Thr Ser		
830	835	840	845	
gtt tat gaa gaa ggt gat	gct cgt tct gct	ctt att act atg ctt	cag	2895
Val Tyr Glu Glu Gly Asp	Ala Arg Ser Ala	Leu Ile Thr Met	Leu Gln	
850	855	860		
tct ctt cac cat gcc aaa aat ggt	gtt gac att gtc tct	ggc acc aga		2943
Ser Leu His His Ala Lys Asn Gly	Val Asp Ile Val	Ser Gly Thr Arg		
865	870	875		
gtt aag tca cat ttt gct aaa cct	aat tgg cgt aat gtc tac	aaa cgc		2991
Val Lys Ser His Phe Ala Lys Pro	Asn Trp Arg Asn	Val Tyr Lys Arg		
880	885	890		
att gct ctc aac cac cct gag	gct aaa gtt ggg gtc	ttc tat tgt ggg		3039
Ile Ala Leu Asn His Pro	Glu Ala Lys Val	Phe Tyr Cys Gly		
895	900	905		
gca cca gca ctg acc aaa gaa cta	aga caa cac gcc	ttg gat ttt tca		3087
Ala Pro Ala Leu Thr Lys Glu Leu Arg Gln His Ala	Leu Asp Phe Ser			
910	915	920	925	
cac aag aca tct acc aag ttt gat	ttc cat aaa gaa aat ttt			3129
His Lys Thr Ser Thr Lys Phe Asp Phe His Lys Glu Asn Phe				
930	935			
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Ser Gly Pro Leu Asn Lys Arg Gly	Gly Lys Ser Ala Arg Phe Asn			
35 40 45				
Ile Pro Glu Ser Thr Asp Ile Gly Thr Ser Val	Gly Thr Gly Lys			
50 55 60				
Ser Asn Asp Asp Ala Tyr Val Glu Ile Thr Leu Asp Val	Arg Glu Asp			
65 70 75 80				
Ser Val Ala Val His Ser Val Lys Thr Ala Gly	Gly Asp Asp Val Glu			
85 90 95				
Asp Pro Glu Leu Ala Leu Ala Lys Gly	Leu Glu Lys Lys Ser Thr			
100 105 110				
Leu Gly Ser Ser Leu Val Arg Asn Ala Ser Ser Arg	Ile Arg Gln Val			
115 120 125				
Ser Gln Glu Leu Arg Arg Leu Ala Ser Leu Asn Lys Arg	Pro Ile Pro			
130 135 140				
Thr Gly Arg Phe Asp Arg Asn Lys Ser Ala Ala His	Ala Leu Lys			
145 150 155 160				

Sequence Listing

Gly Leu Lys Phe Ile Ser Lys Thr Asp Gly Gly Ala Gly Trp Ala Ala
 165 170 175
 Val Glu Lys Arg Phe Asp Glu Ile Thr Ala Ser Thr Thr Gly Leu Leu
 180 185 190
 Pro Arg Ala Lys Phe Gly Glu Cys Ile Gly Met Asn Lys Glu Ser Lys
 195 200 205
 Glu Phe Ala Val Glu Leu Tyr Asp Ala Leu Ala Arg Arg Arg Asn Ile
 210 215 220
 Thr Thr Asp Ser Ile Asn Lys Ala Gln Leu Lys Glu Phe Trp Asp Gln
 225 230 235 240
 Val Ala Asp Gln Ser Phe Asp Ser Arg Leu Gln Thr Phe Phe Asp Met
 245 250 255
 Val Asp Lys Asp Ala Asp Gly Arg Ile Thr Glu Glu Glu Val Arg Glu
 260 265 270
 Ile Ile Gly Leu Ser Ala Ser Ala Asn Arg Leu Ser Thr Ile Gln Lys
 275 280 285
 Gln Ala Asp Glu Tyr Ala Ala Met Ile Met Glu Glu Leu Asp Pro Asn
 290 295 300
 Asn Leu Gly Tyr Ile Met Ile Glu Asn Leu Glu Met Leu Leu Leu Gln
 305 310 315 320
 Ala Pro Asn Gln Ser Val Gln Arg Gly Gly Glu Ser Arg Asn Leu Ser
 325 330 335
 Gln Met Leu Ser Gln Lys Leu Lys His Thr Gln Glu Arg Asn Pro Ile
 340 345 350
 Val Arg Trp Tyr Lys Ser Phe Met Tyr Phe Leu Leu Asp Asn Trp Gln
 355 360 365
 Arg Val Trp Val Leu Leu Leu Trp Ile Gly Ile Met Ala Gly Leu Phe
 370 375 380
 Thr Trp Lys Tyr Ile Gln Tyr Lys Glu Lys Ala Ala Tyr Lys Val Met
 385 390 395 400
 Gly Pro Cys Val Cys Phe Ala Lys Gly Ala Ala Glu Thr Leu Lys Leu
 405 410 415
 Asn Met Ala Ile Ile Leu Phe Pro Val Cys Arg Asn Thr Ile Thr Trp
 420 425 430
 Leu Arg Asn Lys Thr Arg Leu Gly Ala Ala Val Pro Phe Asp Asp Asn
 435 440 445
 Leu Asn Phe His Lys Val Ile Ala Val Ala Ile Ala Leu Gly Val Gly
 450 455 460
 Ile His Gly Leu Ser His Leu Thr Cys Asp Phe Pro Arg Leu Leu Asn
 465 470 475 480
 Ala Ser Glu Glu Glu Tyr Glu Pro Met Lys Tyr Tyr Phe Gly Asp Gln
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 Pro Glu Ser Tyr Trp Trp Phe Ile Lys Gly Val Glu Gly Val Thr Gly
 500 505 510
 Ile Ile Met Val Val Leu Met Ala Ile Ala Phe Thr Leu Ala Thr Pro
 515 520 525
 Trp Phe Arg Arg Asn Arg Val Ser Leu Pro Lys Pro Phe His Lys Leu
 530 535 540
 Thr Gly Xaa Asn Ala Phe Trp Tyr Ser His His Leu Phe Val Ile Val
 545 550 555 560
 Tyr Thr Leu Phe Ile Val His Gly Glu Lys Leu Tyr Ile Thr Lys Asp
 565 570 575
 Trp Tyr Lys Arg Thr Asp Met Asp Val Leu Leu Thr Ile Pro Ile Ile
 580 585 590
 Leu Tyr Ala Ser Glu Arg Leu Ile Arg Ala Phe Arg Ser Ser Ile Lys
 595 600 605
 Ala Val Lys Ile Leu Lys Val Ala Val Tyr Pro Gly Asn Val Leu Ala
 610 615 620
 Leu His Met Ser Lys Pro Gln Gly Tyr Lys Tyr Lys Ser Gly Gln Tyr
 625 630 635 640
 Met Phe Val Asn Cys Ala Ala Val Ser Pro Phe Glu Trp His Pro Phe
 645 650 655
 Ser Ile Thr Ser Ala Pro Gly Asp Asp Tyr Leu Ser Val His Ile Arg

Sequence Listing

660	665	670
Thr Leu Gly Asp Trp Thr Arg Gln	Leu Lys Thr Val Phe Ser Glu Val	
675	680	685
Cys Gln Pro Pro Pro Asn Gly	Lys Ser Gly Leu Leu Arg Ala Asp Tyr	
690	695	700
Leu Gln Gly Glu Asn Asn Pro Asn Phe Pro Arg Val Leu Ile Asp Gly		
705	710	715
Pro Tyr Gly Ala Pro Ala Gln Asp Tyr Lys Lys Tyr Glu Val Val Leu		
725	730	735
Leu Val Gly Leu Gly Ile Gly Ala Thr Pro Met Ile Ser Ile Val Lys		
740	745	750
Asp Ile Val Asn Asn Met Lys Ala Met Asp Glu Glu Glu Asn Ser Leu		
755	760	765
Glu Asp Gly His Asn Asn Met Ala Pro Asn Ser Ser Pro Asn Ile		
770	775	780
Ala Lys Asn Lys Gly Asn Lys Ser Gly Ser Ala Ser Gly Gly Asn Asn		
785	790	795
Phe Asn Thr Arg Arg Ala Tyr Phe Tyr Trp Val Thr Arg Glu Gln Gly		
805	810	815
Ser Phe Asp Trp Phe Lys Gly Ile Met Asn Glu Ala Ala Glu Met Asp		
820	825	830
His Lys Gly Val Ile Glu Met His Asn Tyr Cys Thr Ser Val Tyr Glu		
835	840	845
Glu Gly Asp Ala Arg Ser Ala Leu Ile Thr Met Leu Gln Ser Leu His		
850	855	860
His Ala Lys Asn Gly val Asp Ile Val Ser Gly Thr Arg Val Lys Ser		
865	870	875
His Phe Ala Lys Pro Asn Trp Arg Asn Val Tyr Lys Arg Ile Ala Leu		
885	890	895
Asn His Pro Glu Ala Lys Val Gly Val Phe Tyr Cys Gly Ala Pro Ala		
900	905	910
Leu Thr Lys Glu Leu Arg Gln His Ala Leu Asp Phe Ser His Lys Thr		
915	920	925
Ser Thr Lys Phe Asp Phe His Lys Glu Asn Phe		
930	935	

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Gly Leu Pro Arg Pro Pro Gly Ala Gly Ala Gly Ala Ala Ala Gly Gly	
20 25 30	
tcc gcg cgg ggg ctg atg aag cag ccg tcg ccg ctg gcg tcc ggg gtg	144
Phe Ala Arg Gly Leu Met Lys Gln Pro Ser Arg Leu Ala Ser Gly Val	
35 40 45	
agg cag ttc gcg tcg agg gtg tcg atg aag gtg ccg gag ggg gtg ggg	192
Arg Gln Phe Ala Ser Arg Val Ser Met Lys Val Pro Glu Gly Val Gly	
50 55 60	
ggg atg cgg ccc ggt ggc ggg agg atg acg ccg atg cag tcc agc gcg	240
Gly Met Arg Pro Gly Gly Arg Met Thr Arg Met Gln Ser Ser Ala	
65 70 75 80	
cag gtg ggg ctc ccg ggg ctc cgc ttc ctc gac aag acg tcc ggc ggg	288
Gln Val Gly Leu Arg Gly Leu Arg Phe Leu Asp Lys Thr Ser Gly Gly	
85 90 95	

Sequence Listing

aag gag ggg tgg aag tcc gtc gag cgc cgc ttc gac gag atg aac cgc Lys Glu Gly Trp Lys Ser Val Glu Arg Arg Phe Asp Glu Met Asn Arg	336
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aac ggc cgc ctc ccc aag gag agc ttc ggc aag tgc atc ggc atg ggg Asn Gly Arg Leu Pro Lys Glu Ser Phe Gly Lys Cys Ile Gly Met Gly	384
115 120 125	
gac tcc aag gag ttc gcc ggc gag ctg ttc gtg gcg ctg gcg cgg cgg Asp Ser Lys Glu Phe Ala Gly Glu Leu Phe Val Ala Leu Ala Arg Arg	432
130 135 140	
agg aac ctg gag ccg gag gac ggc atc acc aag gag cag ctc aag gag Arg Asn Leu Glu Pro Glu Asp Gly Ile Thr Lys Glu Gln Leu Lys Glu	480
145 150 155 160	
ttc tgg gag gag atg acc gac cag aac ttc gac tcg cgg ctt cgc att Phe Trp Glu Glu Met Thr Asp Gln Asn Phe Asp Ser Arg Leu Arg Ile	528
165 170 175	
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180 185 190	
gag gtc aag gag gtt att ata ctg agt gcg tcg gcg aac aag ctg gcg Glu Val Lys Glu Val Ile Ile Leu Ser Ala Ser Ala Asn Lys Leu Ala	624
195 200 205	
aag ctg aag gga cac gcg gcg acg tac gcg tcg ctg atc atg gag gag Lys Leu Lys Gly His Ala Ala Thr Tyr Ala Ser Leu Ile Met Glu Glu	672
210 215 220	
ctg gac ccg gac gac cgc ggg tac atc gag atc tgg cag ctg gag acg Leu Asp Pro Asp Asp Arg Gly Tyr Ile Glu Ile Trp Gln Leu Glu Thr	720
225 230 235 240	
ctg ctg cgc ggc atg gtg agc gcg cag gcg gcg ccg gag aag atg aag Leu Leu Arg Gly Met Val Ser Ala Gln Ala Ala Pro Glu Lys Met Lys	768
245 250 255	
cgg acg acg tcg agc ctc gcg agg acg atg atc ccg tcg cgg tac cgg Arg Thr Thr Ser Ser Leu Ala Arg Thr Met Ile Pro Ser Arg Tyr Arg	816
260 265 270	
agc ccg ctg aag cgg cac gtg tcc agg acg gtg gac ttc gtg cac gag Ser Pro Leu Lys Arg His Val Ser Arg Thr Val Asp Phe Val His Glu	864
275 280 285	
aac tgg aag cgg atc tgg ctc gtc gcg ctg tgg ctc gcc gtc aac gtc Asn Trp Lys Arg Ile Trp Leu Val Ala Leu Trp Leu Ala Val Asn Val	912
290 295 300	
ggc ctc ttc gcc tac aag ttc gag cag tac gag cgg cgc gcc gcg ttc Gly Leu Phe Ala Tyr Lys Phe Glu Gln Tyr Glu Arg Arg Ala Ala Phe	960
305 310 315 320	
cag gtg atg ggc cac tgc gtg tgc gtg gcc aag ggc gcc gcc gag gtg Gln Val Met Gly His Cys Val Cys Val Ala Lys Gly Ala Ala Glu Val	1008
325 330 335	
ctc aag ctc aac atg gcg ctc atc ctc ctc ccc gtg tgc cgg aac acg Leu Lys Leu Asn Met Ala Leu Ile Leu Leu Pro Val Cys Arg Asn Thr	1056
340 345 350	
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355 360 365	
gac aac atc aac ttc cac aag gtg atc gcg gcg acc atc gcc gcc gcc Asp Asn Ile Asn Phe His Lys Val Ile Ala Ala Thr Ile Ala Ala Ala	1152
370 375 380	
acc gcc gtc cac acg ctg gcg cac gtc acc tgc gac ttc ccg agg ctg Thr Ala Val His Thr Leu Ala His Val Thr Cys Asp Phe Pro Arg Leu	1200
385 390 395 400	
atc aac tgc ccc acg gac aag ttc atg gcg acg ctg ggg ccg aac ttc Ile Asn Cys Pro Ser Asp Lys Phe Met Ala Thr Leu Gly Pro Asn Phe	1248
405 410 415	
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420 425 430	

Sequence Listing

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Val Thr Gly Ile Leu Met Ile Ile Ile Met Ser Phe Ser Phe Thr Leu	
435 440 445	
gcc acg cac tcc ttc cgc cg ^g agc gtc gtc aag ctg ccg tcg ccg ctg	1392
Ala Thr His Ser Phe Arg Arg Ser Val Val Lys Leu Pro Ser Pro Leu	
450 455 460	
cac cac ctc gcc ggc ttc aac gcc ttc tgg tac gcg cac cac ctc ctg	1440
His His Leu Ala Gly Phe Asn Ala Phe Trp Tyr Ala His His Leu Leu	
465 470 475 480	
gtg ctc gcc tac gtc ctc ctc gtc gtg cac tcc tac ttc ata ttc ctc	1488
Val Leu Ala Tyr Val Leu Leu Val Val His Ser Tyr Phe Ile Phe Leu	
485 490 495	
acc agg gag tgg tac aag aaa acg aca tgg atg tac ctg ata gtc cca	1536
Thr Arg Glu Trp Tyr Lys Lys Thr Thr Trp Met Tyr Leu Ile Val Pro	
500 505 510	
gtg ctc ttc tat gca tgc gag aga acg atc aga aaa gtt cga gag aac	1584
Val Leu Phe Tyr Ala Cys Glu Arg Thr Ile Arg Lys Val Arg Glu Asn	
515 520 525	
aac tac cgc gtg agc atc gtc aag gca gcg att tac cca gga aat gtg	1632
Asn Tyr Arg Val Ser Ile Val Lys Ala Ala Ile Tyr Pro Gly Asn Val	
530 535 540	
ctc tct ctt cac atg aag aag ccg ccg ggt ttc aag tac aag agc ggg	1680
Leu Ser Leu His Met Lys Lys Pro Pro Gly Phe Lys Tyr Lys Ser Gly	
545 550 555 560	
atg tac ctg ttt gtg aag tgc cct gat gtc tct cct ttc gaa tgg cat	1728
Met Tyr Leu Phe Val Lys Cys Pro Asp Val Ser Pro Phe Glu Trp His	
565 570 575	
ccc ttc tcc atc act tct gca cct gga gat gac tac ctg agt gtg cat	1776
Pro Phe Ser Ile Thr Ser Ala Pro Gly Asp Asp Tyr Leu Ser Val His	
580 585 590	
atc cgt aca cta ggt gac tgg acg act gaa ctc aga aac ctg ttt ggg	1824
Ile Arg Thr Leu Gly Asp Trp Thr Thr Glu Leu Arg Asn Leu Phe Gly	
595 600 605	
aag gct tgc gag gca cag gtt act tct aag aag gct acc ctt tca aga	1872
Lys Ala Cys Glu Ala Gln Val Thr Ser Lys Lys Ala Thr Leu Ser Arg	
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Leu Glu Thr Thr Val Val Ala Asp Ala Gln Thr Glu Asp Thr Arg Phe	
625 630 635 640	
cct aag gtc ctt att gat ggg ccc tat ggt gca ccg gcg caa aac tac	1968
Pro Lys Val Leu Ile Asp Gly Pro Tyr Gly Ala Pro Ala Gln Asn Tyr	
645 650 655	
aag aag tat gac att ctt ttg ctt att ggt ctt gga att ggt gct act	2016
Lys Lys Tyr Asp Ile Leu Leu Ile Gly Leu Gly Ile Gly Ala Thr	
660 665 670	
cct ttc atc agc att ctg aag gat ctg ttg aac aac att aaa tcc aac	2064
Pro Phe Ile Ser Ile Leu Lys Asp Leu Leu Asn Asn Ile Lys Ser Asn	
675 680 685	
gaa gag gtg gaa agc ata cat ggt tct gag ata ggc agc ttc aag aac	2112
Glu Glu Val Glu Ser Ile His Gly Ser Glu Ile Gly Ser Phe Lys Asn	
690 695 700	
aat ggg cca gga aga gct tac ttc tac tgg gtg acc aga gag caa ggg	2160
Asn Gly Pro Gly Arg Ala Tyr Phe Tyr Trp Val Thr Arg Glu Gln Gly	
705 710 715 720	
tcc ttc gag tgg ttt aaa gga gtc atg aac gat gtc gct gaa agt gat	2208
Ser Phe Glu Trp Phe Lys Gly Val Met Asn Asp Val Ala Glu Ser Asp	
725 730 735	
cac aat aat att ata gag atg cac aat tac ctg acc agc gtg tat gaa	2256
His Asn Asn Ile Ile Glu Met His Asn Tyr Leu Thr Ser Val Tyr Glu	
740 745 750	
gaa ggc gac gca agg tca gct ttg att gcc atg gtt cag tca ctt caa	2304
Glu Gly Asp Ala Arg Ser Ala Leu Ile Ala Met Val Gln Ser Leu Gln	
755 760 765	

Sequence Listing

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cat ttt gcg agg cct aac tgg aga aag gtg ttc tct gac ttg gcg aat His Phe Ala Arg Pro Asn Trp Arg Lys Val Phe Ser Asp Leu Ala Asn 785 790 795 800	2400
gcc cac aaa aac tca cgc ata ggt gtt ttc tat tgt gga tcc cct aca Ala His Lys Asn Ser Arg Ile Gly Val Phe Tyr Cys Gly Ser Pro Thr 805 810 815	2448
ctc acg aaa caa ctc aag gat ctt tca aaa gaa ttc agc cag aca acc Leu Thr Lys Gln Leu Lys Asp Leu Ser Lys Glu Phe Ser Gln Thr Thr 820 825 830	2496
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<212> PRT

<213> Oryza sativa

<400> 18

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Arg Gln Phe Ala Ser Arg Val Ser Met Lys Val Pro Glu Gly Val Gly 50 55 60
Gly Met Arg Pro Gly Gly Arg Met Thr Arg Met Gln Ser Ser Ala 65 70 75 80
Gln Val Gly Leu Arg Gly Leu Arg Phe Leu Asp Lys Thr Ser Gly Gly 85 90 95
Lys Glu Gly Trp Lys Ser Val Glu Arg Arg Phe Asp Glu Met Asn Arg 100 105 110
Asn Gly Arg Leu Pro Lys Glu Ser Phe Gly Lys Cys Ile Gly Met Gly 115 120 125
Asp Ser Lys Glu Phe Ala Gly Glu Leu Phe Val Ala Leu Ala Arg Arg 130 135 140
Arg Asn Leu Glu Pro Glu Asp Gly Ile Thr Lys Glu Gln Leu Lys Glu 145 150 155 160
Phe Trp Glu Glu Met Thr Asp Gln Asn Phe Asp Ser Arg Leu Arg Ile 165 170 175
Phe Phe Asp Met Cys Asp Lys Asn Gly Asp Gly Met Leu Thr Glu Asp 180 185 190
Glu Val Lys Glu Val Ile Ile Leu Ser Ala Ser Ala Asn Lys Leu Ala 195 200 205
Lys Leu Lys Gly His Ala Ala Thr Tyr Ala Ser Leu Ile Met Glu Glu 210 215 220
Leu Asp Pro Asp Asp Arg Gly Tyr Ile Glu Ile Trp Gln Leu Glu Thr 225 230 235 240
Leu Leu Arg Gly Met Val Ser Ala Gln Ala Ala Pro Glu Lys Met Lys 245 250 255
Arg Thr Thr Ser Ser Leu Ala Arg Thr Met Ile Pro Ser Arg Tyr Arg 260 265 270
Ser Pro Leu Lys Arg His Val Ser Arg Thr Val Asp Phe Val His Glu 275 280 285
Asn Trp Lys Arg Ile Trp Leu Val Ala Leu Trp Leu Ala Val Asn Val 290 295 300
Gly Leu Phe Ala Tyr Lys Phe Glu Gln Tyr Glu Arg Arg Ala Ala Phe 305 310 315 320
Gln Val Met Gly His Cys Val Cys Val Ala Lys Gly Ala Ala Glu Val 325 330 335
Leu Lys Leu Asn Met Ala Leu Ile Leu Pro Val Cys Arg Asn Thr

Sequence Listing

340	345	350	
Leu Thr Thr Leu Arg Ser Thr Ala	Leu Ser His Val Ile	Pro Phe Asp	
355	360	365	
Asp Asn Ile Asn Phe His Lys Val Ile Ala Ala Thr	Ile Ala Ala Ala		
370	375	380	
Thr Ala Val His Thr Leu Ala His Val Thr Cys	Asp Phe Pro Arg	Leu	
385	390	395	400
Ile Asn Cys Pro Ser Asp Lys Phe Met Ala Thr	Leu Gly Pro Asn Phe		
405	410	415	
Gly Tyr Arg Gln Pro Thr Tyr Ala Asp Leu Leu Glu	Ser Ala Pro Gly		
420	425	430	
Val Thr Gly Ile Leu Met Ile Ile Met Ser Phe	Ser Phe Thr Leu		
435	440	445	
Ala Thr His Ser Phe Arg Arg Ser Val Val Lys	Leu Pro Ser Pro Leu		
450	455	460	
His His Leu Ala Gly Phe Asn Ala Phe Trp Tyr	Ala His His Leu	Leu	
465	470	475	480
Val Leu Ala Tyr Val Leu Leu Val Val His Ser	Tyr Phe Ile Phe	Leu	
485	490	495	
Thr Arg Glu Trp Tyr Lys Lys Thr Thr Trp Met	Tyr Leu Ile Val Pro		
500	505	510	
Val Leu Phe Tyr Ala Cys Glu Arg Thr Ile Arg	Lys Val Arg Glu Asn		
515	520	525	
Asn Tyr Arg Val Ser Ile Val Lys Ala Ala Ile	Tyr Pro Gly Asn Val		
530	535	540	
Leu Ser Leu His Met Lys Lys Pro Pro Gly	Phe Lys Tyr Lys Ser Gly		
545	550	555	560
Met Tyr Leu Phe Val Lys Cys Pro Asp Val Ser	Pro Phe Glu Trp His		
565	570	575	
Pro Phe Ser Ile Thr Ser Ala Pro Gly Asp Asp	Tyr Leu Ser Val His		
580	585	590	
Ile Arg Thr Leu Gly Asp Trp Thr Thr Glu Leu Arg	Asn Leu Phe Gly		
595	600	605	
Lys Ala Cys Glu Ala Gln Val Thr Ser Lys Lys	Ala Thr Leu Ser Arg		
610	615	620	
Leu Glu Thr Thr Val Val Ala Asp Ala Gln	Thr Glu Asp Thr Arg Phe		
625	630	635	640
Pro Lys Val Leu Ile Asp Gly Pro Tyr Gly	Ala Pro Ala Gln Asn Tyr		
645	650	655	
Lys Lys Tyr Asp Ile Leu Leu Leu Ile	Gly Leu Gly Ile Gly Ala Thr		
660	665	670	
Pro Phe Ile Ser Ile Leu Lys Asp Leu Leu Asn	Asn Ile Lys Ser Asn		
675	680	685	
Glu Glu Val Glu Ser Ile His Gly Ser Glu Ile	Gly Ser Phe Lys Asn		
690	695	700	
Asn Gly Pro Gly Arg Ala Tyr Phe Tyr Trp	Val Thr Arg Glu Gln Gly		
705	710	715	720
Ser Phe Glu Trp Phe Lys Gly Val Met Asn Asp	Val Ala Glu Ser Asp		
725	730	735	
His Asn Asn Ile Ile Glu Met His Asn Tyr	Leu Thr Ser Val Tyr Glu		
740	745	750	
Glu Gly Asp Ala Arg Ser Ala Leu Ile Ala Met	Val Gln Ser Leu Gln		
755	760	765	
His Ala Lys Asn Gly Val Asp Ile Val Ser	Gly Ser Arg Ile Arg Thr		
770	775	780	
His Phe Ala Arg Pro Asn Trp Arg Lys Val	Phe Ser Asp Leu Ala Asn		
785	790	795	800
Ala His Lys Asn Ser Arg Ile Gly Val Phe	Tyr Cys Gly Ser Pro Thr		
805	810	815	
Leu Thr Lys Gln Leu Lys Asp Leu Ser Lys Glu	Phe Ser Gln Thr Thr		
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Thr Thr Arg Phe His Phe His Lys Glu Asn Phe			
835	840		

Sequence Listing

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<223> coding for NADPH oxidase
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gaa gcc gga aac agc gga cca atg agc ggt ggt caa tta cca ccg atc 96
Glu Ala Gly Asn Ser Gly Pro Met Ser Gly Gly Gln Leu Pro Pro Ile
    20          25          30
tat aaa aaa ccg ggg aac tcc aga ttc act gct gag aac agt cag aga 144
Tyr Lys Lys Pro Gly Asn Ser Arg Phe Thr Ala Glu Asn Ser Gln Arg
    35          40          45
aca cgt acg gca cca tac gtg gac ctc acg gta gat gta caa gac gat 192
Thr Arg Thr Ala Pro Tyr Val Asp Leu Thr Val Asp Val Gln Asp Asp
    50          55          60
aca gtc tct gta cat agc ttg aaa atg gaa ggt gga tct agc gtt gaa 240
Thr Val Ser Val His Ser Leu Lys Met Glu Gly Gly Ser Ser Val Glu
    65          70          75          80
gag agt ccg gag ctt act ttg ctg aaa cga aac cgt ctt gag aag aaa 288
Glu Ser Pro Glu Leu Thr Leu Lys Arg Asn Arg Leu Glu Lys Lys
    85          90          95
aca acg gtg gtg aaa cgt ttg gcg tct gtt tct cac gag ctt aag cgt 336
Thr Thr Val Val Lys Arg Leu Ala Ser Val Ser His Glu Leu Lys Arg
    100         105         110
ttg aca tct gtt tct ggt ggt att ggt gga aga aag ccg cct cga ccg 384
Leu Thr Ser Val Ser Gly Gly Ile Gly Gly Arg Lys Pro Pro Arg Pro
    115         120         125
gct aag tta gac cg act aaa tcc gcc gcg agt caa gcg ttg aag gga 432
Ala Lys Leu Asp Arg Thr Lys Ser Ala Ala Ser Gln Ala Leu Lys Gly
    130         135         140
ctt aag ttc att agt aaa acc gac ggt ggc gcc ggt tgg tct gcc gtg 480
Leu Lys Phe Ile Ser Lys Thr Asp Gly Gly Ala Gly Trp Ser Ala Val
    145         150         155         160
gag aag cg ttt aat cag att acc gcg act acc ggt gga cta ctt ctt 528
Glu Lys Arg Phe Asn Gln Ile Thr Ala Thr Thr Gly Gly Leu Leu Leu
    165         170         175
cg aca aag ttc ggt gaa tgc ata gga atg act tca aag gat ttt gct 576
Arg Thr Lys Phe Gly Glu Cys Ile Gly Met Thr Ser Lys Asp Phe Ala
    180         185         190
ttg gaa ctg ttt gat gca ttg gct aga aga agg aat ata aca ggg gaa 624
Leu Glu Leu Phe Asp Ala Leu Ala Arg Arg Arg Asn Ile Thr Gly Glu
    195         200         205
gtg att gat gga gat caa cta aag gag ttt tgg gaa caa att aat gat 672
Val Ile Asp Gly Asp Gln Leu Lys Glu Phe Trp Glu Gln Ile Asn Asp
    210         215         220
caa agt ttt gat tct cgg ctt aag aca ttc ttt gac atg gtg gat aaa 720
Gln Ser Phe Asp Ser Arg Leu Lys Thr Phe Phe Asp Met Val Asp Lys
    225         230         235         240
gat gct gat ggt aga ctt aca gaa gac gaa gtt aga gag ttg gag agt 768
Asp Ala Asp Gly Arg Leu Thr Glu Asp Glu Val Arg Glu Leu Glu Ser
    245         250         255
ctt gag act ctg ctt ttg caa gcg gca aca cag tct gtg ata aca agt 816
Leu Glu Thr Leu Leu Leu Gln Ala Ala Thr Gln Ser Val Ile Thr Ser
    260         265         270
act ggg gag aga aag aat ctg agt cat atg atg agt cag agg ctt aag 864
Thr Gly Glu Arg Lys Asn Leu Ser His Met Met Ser Gln Arg Leu Lys

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Sequence Listing

275	280	285	
cct acg ttt aac cgc aac ccg	ttg aag cga tgg tac	cgt ggt ctt aga	912
Pro Thr Phe Asn Arg Asn Pro	Leu Lys Arg Trp Tyr	Arg Gly Leu Arg	
290	295	300	
tcc ttc ttg tta gac aac tgg	caa aga tgt tgg gtt	ata gtg cta tgg	960
Phe Phe Leu Leu Asp Asn Trp	Gln Arg Cys Trp Val Ile	Val Leu Trp	
305	310	315	320
ttc ata gtt atg gct ata ctc	tac acc tac aaa tat atc	caa tac agg	1008
Phe Ile Val Met Ala Ile Leu	Phe Thr Tyr Lys Tyr Ile	Gln Tyr Arg	
325	330	335	
cgt agc cct gtg tat cca	gtg atg ggt gat ttt gtg	tgc atg gct aaa	1056
Arg Ser Pro Val Tyr Pro Val	Met Gly Asp Cys Val	Cys Met Ala Lys	
340	345	350	
ggt gct gca gaa aca gtg aag	ctg aac atg gct ttg	att ctc tta cct	1104
Gly Ala Ala Glu Thr Val Lys	Leu Asn Met Ala Leu	Ile Leu Leu Pro	
355	360	365	
gtt tgt aga aac acc atc aca	tgg ctt aga aat aag	acc agg ttg ggt	1152
Val Cys Arg Asn Thr Ile Thr	Trp Leu Arg Asn Lys	Thr Arg Leu Gly	
370	375	380	
cgt gtt gtc cca ttt gat gac	aat ctc aac ttc cac	aag gtt ata gcg	1200
Arg Val Val Pro Phe Asp Asp	Asn Leu Asn Phe His	Lys Val Ile Ala	
385	390	395	400
gtg ggg att ata gtt gga gta	acg atg cac gcc ggg	gca cat tta gcg	1248
Val Gly Ile Ile Val Gly Val	Thr Met His Ala Gly	Ala His Leu Ala	
405	410	415	
tgt gat ttc ccg cggtt aca cat	gca act cca gag gca	tat agg cct	1296
Cys Asp Phe Pro Arg Leu Leu	His Ala Thr Pro Glu Ala	Tyr Arg Pro	
420	425	430	
tta aga cag ttt ttt ggg gat	gag caa cca aag agc	tac tgg cat ttt	1344
Leu Arg Gln Phe Phe Gly Asp	Glu Gln Pro Lys Ser	Tyr Trp His Phe	
435	440	445	
gta aac tcg gta gaa ggt ata	acc gga ctt gtg atg	gtt ttg tta atg	1392
Val Asn Ser Val Glu Gly Ile	Thr Gly Leu Val Met	Val Leu Leu Met	
450	455	460	
gcg att gca ttc aca cta	gcc acg cct tgg ttc	aga aga ggg aag cta	1440
Ala Ile Ala Phe Thr Leu Ala	Thr Pro Trp Phe Arg	Arg Gly Lys Leu	
465	470	475	480
aac tat ctt cca gga cca tta	aag aaa cta gct agc	ttc aat gcc ttc	1488
Asn Tyr Leu Pro Gly Pro Leu	Lys Leu Ala Ser Phe	Asn Ala Phe	
485	490	495	
tgg tac act cat cat ttgtt	gtc ata gtc tac att	ctt ctt gtt gct	1536
Trp Tyr Thr His His Leu Phe	Val Ile Val Tyr Ile	Leu Leu Val Ala	
500	505	510	
cat gga tac tac ttgttat ctc	acc aga gac tgg cac	aat aaa acg act	1584
His Gly Tyr Tyr Leu Tyr Leu	Thr Arg Asp Trp His	Asn Lys Thr Thr	
515	520	525	
tgg atg tat ttgtgtgtt gta	cca gtg gtt cta tac	gcttgt gaa agg ttg	1632
Trp Met Tyr Leu Val Val Pro	Val Leu Tyr Ala Cys	Glu Arg Leu	
530	535	540	
ata aga gca ttc agg tcg	agc atc aag gcg	gtg act att agg aaa gta	1680
Ile Arg Ala Phe Arg Ser Ser	Ile Lys Ala Val	Thr Ile Arg Lys Val	
545	550	555	560
gca gtt tat cca gga aac	gtg ctg gca att cac	ttg tca agg cct caa	1728
Ala Val Tyr Pro Gly Asn Val	Leu Ala Ile His	Leu Ser Arg Pro Gln	
565	570	575	
aac ttc aaa tac aag agt	ggt caa tac atg ttt	gtt aac tgt gct gct	1776
Asn Phe Lys Tyr Lys Ser Gly	Gln Tyr Met Phe Val	Asn Cys Ala Ala	
580	585	590	
gtt tct cca ttt gaa tgg	cat cca ttt tca atc	aca tct gca cca caa	1824
Val Ser Pro Phe Glu Trp His	Pro Phe Ser Ile	Thr Ser Ala Pro Gln	
595	600	605	
gat gat tac cta agt gtt cac	att aga gtt ctt ggg	gat tgg aca cga	1872
Asp Asp Tyr Leu Ser Val His	Ile Arg Val Leu	Gly Asp Trp Thr Arg	

Sequence Listing

610	615	620	
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625	630	635	640
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Val Ser Gly Leu Leu Arg Ala Asp Met Leu His Gly Ala Asn Asn Pro			
645	650	655	
gac ttc ccg aaa gtc ttg att gat ggt cca tat ggt gca cca gca caa			2016
Asp Phe Pro Lys Val Leu Ile Asp Gly Pro Tyr Gly Ala Pro Ala Gln			
660	665	670	
gac tac aag aag tac gag gtg gtt cta cta gtt ggt ctc ggg att gga			2064
Asp Tyr Lys Lys Tyr Glu Val Val Leu Leu Val Gly Leu Gly Ile Gly			
675	680	685	
gcc aca cca atg atc agt atc gtc aaa gac att gtt aat aac atc aag			2112
Ala Thr Pro Met Ile Ser Ile Val Lys Asp Ile Val Asn Asn Ile Lys			
690	695	700	
gcc aag gaa caa gcc caa cta aac cga atg gag aat gga aca agc gaa			2160
Ala Lys Glu Gln Ala Gln Leu Asn Arg Met Glu Asn Gly Thr Ser Glu			
705	710	715	720
cca caa cga agt aag aaa gag agt ttc agg acc cgt aga gct tac ttc			2208
Pro Gln Arg Ser Lys Lys Glu Ser Phe Arg Thr Arg Arg Ala Tyr Phe			
725	730	735	
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Tyr Trp Val Thr Arg Glu Gln Gly Ser Phe Asp Trp Phe Lys Asn Ile			
740	745	750	
atg aac gaa gtc gcg gaa cga gat gcc aac cgc gtc atc gaa atg cat			2304
Met Asn Glu Val Ala Glu Arg Asp Ala Asn Arg Val Ile Glu Met His			
755	760	765	
aac tat tgt aca agt gtc tat gaa gaa ggt gac gct cgt tcc gca ctt			2352
Asn Tyr Cys Thr Ser Val Tyr Glu Glu Gly Asp Ala Arg Ser Ala Leu			
770	775	780	
ata cat atg ctt caa tca cta aac cat gca aag aac ggc gtc gac att			2400
Ile His Met Leu Gln Ser Leu Asn His Ala Lys Asn Gly Val Asp Ile			
785	790	795	800
gtc tct gga aca aga gtt atg tcc cat ttc gct aaa cct aat tgg aga			2448
Val Ser Gly Thr Arg Val Met Ser His Phe Ala Lys Pro Asn Trp Arg			
805	810	815	
aat gtt tac aag cgt ata gct atg gat cat cct aac acc aaa gtt gga			2496
Asn Val Tyr Lys Arg Ile Ala Met Asp His Pro Asn Thr Lys Val Gly			
820	825	830	
gtg ttt tac tgt gga gca cca gca ttg aca aag gag cta agg cat cta			2544
Val Phe Tyr Cys Gly Ala Pro Ala Leu Thr Lys Glu Leu Arg His Leu			
835	840	845	
gct tta gat ttc acc cac aaa aca agc acc aga ttc tcc ttc cac aaa			2592
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Glu Asn Phe			
865			

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Tyr Lys Lys Pro Gly Asn Ser Arg Phe Thr Ala Glu Asn Ser Gln Arg

35 40 45

Thr Arg Thr Ala Pro Tyr Val Asp Leu Thr Val Asp Val Gln Asp Asp

50 55 60

Thr Val Ser Val His Ser Leu Lys Met Glu Gly Gly Ser Ser Val Glu

Sequence Listing

65	70	75	80
Glu Ser Pro Glu Leu Thr Leu Leu Lys Arg Asn Arg Leu Glu Lys Lys			
85	90	95	
Thr Thr Val Val Lys Arg Leu Ala Ser Val Ser His Glu Leu Lys Arg			
100	105	110	
Leu Thr Ser Val Ser Gly Gly Ile Gly Gly Arg Lys Pro Pro Arg Pro			
115	120	125	
Ala Lys Leu Asp Arg Thr Lys Ser Ala Ala Ser Gln Ala Leu Lys Gly			
130	135	140	
Leu Lys Phe Ile Ser Lys Thr Asp Gly Gly Ala Gly Trp Ser Ala Val			
145	150	155	160
Glu Lys Arg Phe Asn Gln Ile Thr Ala Thr Thr Gly Gly Leu Leu Leu			
165	170	175	
Arg Thr Lys Phe Gly Glu Cys Ile Gly Met Thr Ser Lys Asp Phe Ala			
180	185	190	
Leu Glu Leu Phe Asp Ala Leu Ala Arg Arg Arg Asn Ile Thr Gly Glu			
195	200	205	
Val Ile Asp Gly Asp Gln Leu Lys Glu Phe Trp Glu Gln Ile Asn Asp			
210	215	220	
Gln Ser Phe Asp Ser Arg Leu Lys Thr Phe Phe Asp Met Val Asp Lys			
225	230	235	240
Asp Ala Asp Gly Arg Leu Thr Glu Asp Glu Val Arg Glu Leu Glu Ser			
245	250	255	
Leu Glu Thr Leu Leu Leu Gln Ala Ala Thr Gln Ser Val Ile Thr Ser			
260	265	270	
Thr Gly Glu Arg Lys Asn Leu Ser His Met Met Ser Gln Arg Leu Lys			
275	280	285	
Pro Thr Phe Asn Arg Asn Pro Leu Lys Arg Trp Tyr Arg Gly Leu Arg			
290	295	300	
Phe Phe Leu Leu Asp Asn Trp Gln Arg Cys Trp Val Ile Val Leu Trp			
305	310	315	320
Phe Ile Val Met Ala Ile Leu Phe Thr Tyr Lys Tyr Ile Gln Tyr Arg			
325	330	335	
Arg Ser Pro Val Tyr Pro Val Met Gly Asp Cys Val Cys Met Ala Lys			
340	345	350	
Gly Ala Ala Glu Thr Val Lys Leu Asn Met Ala Leu Ile Leu Leu Pro			
355	360	365	
Val Cys Arg Asn Thr Ile Thr Trp Leu Arg Asn Lys Thr Arg Leu Gly			
370	375	380	
Arg Val Val Pro Phe Asp Asp Asn Leu Asn Phe His Lys Val Ile Ala			
385	390	395	400
Val Gly Ile Ile Val Gly Val Thr Met His Ala Gly Ala His Leu Ala			
405	410	415	
Cys Asp Phe Pro Arg Leu Leu His Ala Thr Pro Glu Ala Tyr Arg Pro			
420	425	430	
Leu Arg Gln Phe Phe Gly Asp Glu Gln Pro Lys Ser Tyr Trp His Phe			
435	440	445	
Val Asn Ser Val Glu Gly Ile Thr Gly Leu Val Met Val Leu Leu Met			
450	455	460	
Ala Ile Ala Phe Thr Leu Ala Thr Pro Trp Phe Arg Arg Gly Lys Leu			
465	470	475	480
Asn Tyr Leu Pro Gly Pro Leu Lys Lys Leu Ala Ser Phe Asn Ala Phe			
485	490	495	
Trp Tyr Thr His His Leu Phe Val Ile Val Tyr Ile Leu Leu Val Ala			
500	505	510	
His Gly Tyr Tyr Leu Tyr Leu Thr Arg Asp Trp His Asn Lys Thr Thr			
515	520	525	
Trp Met Tyr Leu Val Val Pro Val Val Leu Tyr Ala Cys Glu Arg Leu			
530	535	540	
Ile Arg Ala Phe Arg Ser Ser Ile Lys Ala Val Thr Ile Arg Lys Val			
545	550	555	560
Ala Val Tyr Pro Gly Asn Val Leu Ala Ile His Leu Ser Arg Pro Gln			
565	570	575	

Sequence Listing

Asn Phe Lys Tyr Lys Ser Gly Gln Tyr Met Phe Val Asn Cys Ala Ala
 580 585 590
 val Ser Pro Phe Glu Trp His Pro Phe Ser Ile Thr Ser Ala Pro Gln
 595 600 605
 Asp Asp Tyr Leu Ser val His Ile Arg Val Leu Gly Asp Trp Thr Arg
 610 615 620
 Ala Leu Lys Gly Val Phe Ser Glu Val Cys Lys Pro Pro Pro Ala Gly
 625 630 635 640
 Val Ser Gly Leu Leu Arg Ala Asp Met Leu His Gly Ala Asn Asn Pro
 645 650 655
 Asp Phe Pro Lys Val Leu Ile Asp Gly Pro Tyr Gly Ala Pro Ala Gln
 660 665 670
 Asp Tyr Lys Lys Tyr Glu Val Val Leu Leu Val Gly Leu Gly Ile Gly
 675 680 685
 Ala Thr Pro Met Ile Ser Ile Val Lys Asp Ile Val Asn Asn Ile Lys
 690 695 700
 Ala Lys Glu Gln Ala Gln Leu Asn Arg Met Glu Asn Gly Thr Ser Glu
 705 710 715 720
 Pro Gln Arg Ser Lys Lys Glu Ser Phe Arg Thr Arg Arg Ala Tyr Phe
 725 730 735
 Tyr Trp Val Thr Arg Glu Gln Gly Ser Phe Asp Trp Phe Lys Asn Ile
 740 745 750
 Met Asn Glu Val Ala Glu Arg Asp Ala Asn Arg Val Ile Glu Met His
 755 760 765
 Asn Tyr Cys Thr Ser Val Tyr Glu Glu Gly Asp Ala Arg Ser Ala Leu
 770 775 780
 Ile His Met Leu Gln Ser Leu Asn His Ala Lys Asn Gly Val Asp Ile
 785 790 795 800
 Val Ser Gly Thr Arg Val Met Ser His Phe Ala Lys Pro Asn Trp Arg
 805 810 815
 Asn Val Tyr Lys Arg Ile Ala Met Asp His Pro Asn Thr Lys Val Gly
 820 825 830
 Val Phe Tyr Cys Gly Ala Pro Ala Leu Thr Lys Glu Leu Arg His Leu
 835 840 845
 Ala Leu Asp Phe Thr His Lys Thr Ser Thr Arg Phe Ser Phe His Lys
 850 855 860
 Glu Asn Phe
 865

<210> 21
 <211> 2709
 <212> DNA
 <213> Arabidopsis thaliana
 <220>
 <221> CDS
 <222> (1)..(2706)
 <223> coding for NADPH oxidase
 <400> 21

atg atg aat cga agt gaa atg caa aag tta ggt ttc gaa cac gtg aga	48
Met Met Asn Arg Ser Glu Met Gln Lys Leu Gly Phe Glu His Val Arg	
1 5 10 15	
tac tac aca gag tcg ccg tac aac aga gga gag tcc tcg gcg aac gtg	96
Tyr Tyr Thr Glu Ser Pro Tyr Asn Arg Gly Glu Ser Ser Ala Asn Val	
20 25 30	
gcg acg aca agc aac tat tac ggt gaa gat gaa cca tac gtg gag atc	144
Ala Thr Thr Ser Asn Tyr Tyr Gly Glu Asp Glu Pro Tyr Val Glu Ile	
35 40 45	
acg cta gat atc cac gac gat tcc gtc tcc gtg tac ggc ttg aag tca	192
Thr Leu Asp Ile His Asp Asp Ser Val Ser Val Tyr Gly Leu Lys Ser	
50 55 60	
ccg aac cat cga ggg gcc ggg tct aat tat gag gat caa tcg ctt ctc	240
Pro Asn His Arg Gly Ala Gly Ser Asn Tyr Glu Asp Gln Ser Leu Leu	
65 70 75 80	

Sequence Listing

aga caa ggt cgt tca ggg agg agt aac tcg gta ttg aaa cgc ttg gct	288
Arg Gln Gly Arg Ser Gly Arg Ser Asn Ser Val Leu Lys Arg Leu Ala	
85 90 95	
tct tct gtt tcc acc gga ata aca cga gtt gct tct tct gtt tct tcg	336
Ser Ser Val Ser Thr Gly Ile Thr Arg Val Ala Ser Ser Val Ser Ser	
100 105 110	
tct tcc gcg aga aaa cca ccg cgg ccg cag ctg gct aag ctg cgc cgt	384
Ser Ser Ala Arg Lys Pro Pro Arg Pro Gln Leu Ala Lys Leu Arg Arg	
115 120 125	
tcg aaa tct aga gca gag cta gct ctc aaa ggt ctt aaa ttc atc acc	432
Ser Lys Ser Arg Ala Glu Leu Ala Leu Lys Gly Leu Lys Phe Ile Thr	
130 135 140	
aag act gat ggt gtc act ggt tgg cct gaa gtt gag aaa cgg ttt tat	480
Lys Thr Asp Gly Val Thr Gly Trp Pro Glu Val Glu Lys Arg Phe Tyr	
145 150 155 160	
gtg atg aca atg act aat aac gga tta tta cac cga tcc aga ttc ggt	528
Val Met Thr Met Thr Asn Asn Gly Leu Leu His Arg Ser Arg Phe Gly	
165 170 175	
gaa tgt ata ggg atg aaa tcg acg gag ttt gcg ttg gca ttg ttc gat	576
Glu Cys Ile Gly Met Lys Ser Thr Glu Phe Ala Leu Ala Leu Phe Asp	
180 185 190	
gct tta gcg agg agg gaa aac gta agc gga gat tca ata aac atg aat	624
Ala Leu Ala Arg Arg Glu Asn Val Ser Gly Asp Ser Ile Asn Met Asn	
195 200 205	
gag ctt aaa gag ttc tgg aag cag atc act gat caa gat ttt gat tca	672
Glu Leu Lys Glu Phe Trp Lys Gln Ile Thr Asp Gln Asp Phe Asp Ser	
210 215 220	
agg cta cga act ttc ttc gcc atg gtc gat aag gat tcg gat ggg cgg	720
Arg Leu Arg Thr Phe Phe Ala Met Val Asp Lys Asp Ser Asp Gly Arg	
225 230 235 240	
ttg aat gaa gcc gaa gta aga gag att ata act tta agt gct tct gca	768
Leu Asn Glu Ala Glu Val Arg Glu Ile Ile Thr Leu Ser Ala Ser Ala	
245 250 255	
aac gag ttg gat aac att cgg aga caa gct gat gaa tat gat gct gct ttg	816
Asn Glu Leu Asp Asn Ile Arg Arg Gln Ala Asp Glu Tyr Ala Ala Leu	
260 265 270	
att atg gaa ctc gat cct tat cat tat gga tac atc atg ata gag	864
Ile Met Glu Glu Leu Asp Pro Tyr His Tyr Gly Tyr Ile Met Ile Glu	
275 280 285	
aat ctc gag ata ctt cta ttg caa gcg ccg atg cag gat gtg aga gat	912
Asn Leu Glu Ile Leu Leu Gln Ala Pro Met Gln Asp Val Arg Asp	
290 295 300	
gga gag agt aag aag cta agc aag atg cta agt cag aat ctc atg gtt	960
Gly Glu Ser Lys Lys Leu Ser Lys Met Leu Ser Gln Asn Leu Met Val	
305 310 315 320	
ccg cag agt agg aat ctc ggg gca cgt ttt tgc aga ggg atg aag tat	1008
Pro Gln Ser Arg Asn Leu Gly Ala Arg Phe Cys Arg Gly Met Lys Tyr	
325 330 335	
ttt ttg ttt gat aat tgg aag aga gtg tgg gtg atg gct cta tgg ata	1056
Phe Leu Phe Asp Asn Trp Lys Arg Val Trp Val Met Ala Leu Trp Ile	
340 345 350	
ggt gct atg gcg ggt ttg ttc acg tgg aag ttt atg gag tat cga aaa	1104
Gly Ala Met Ala Gly Leu Phe Thr Trp Lys Phe Met Glu Tyr Arg Lys	
355 360 365	
aga tcc gct tac gaa gtc atg gga gtt tgt gtt tgt ata gct aaa gga	1152
Arg Ser Ala Tyr Glu Val Met Gly Val Cys Val Cys Ile Ala Lys Gly	
370 375 380	
gct gca gag acg ctt aaa cta aac atg gct atg att ttg tta cca gtt	1200
Ala Ala Glu Thr Leu Lys Leu Asn Met Ala Met Ile Leu Leu Pro Val	
385 390 395 400	
tgt agg aac acc atc act tgg ctg cgg acc aaa acc aag tta agt gct	1248
Cys Arg Asn Thr Ile Thr Trp Leu Arg Thr Lys Thr Lys Leu Ser Ala	
405 410 415	

Sequence Listing

att gtt cct ttc gat gac agc ctc aat ttt cac aag gtc ata gct ata Ile Val Pro Phe Asp Asp Ser Leu Asn Phe His Lys Val Ile Ala Ile 420 425 430	1296
gga att tca gtt gga gtt gga atc cat gct aca tct cac tta gca tgt Gly Ile Ser Val Gly Val Gly Ile His Ala Thr Ser His Leu Ala Cys 435 440 445	1344
gat ttc ccc cga ctg ata gct gca gac gaa gat cag tat gag cca atg Asp Phe Pro Arg Leu Ile Ala Ala Asp Glu Asp Gln Tyr Glu Pro Met 450 455 460	1392
gag aag tat ttt ggg cca cag aca aag aga tat ttg gac ttt gtt caa Glu Lys Tyr Phe Gly Pro Gln Thr Lys Arg Tyr Leu Asp Phe Val Gln 465 470 475 480	1440
tcg gta gaa gga gtt acc ggg att gga atg gtt gta cta atg acc ata Ser Val Glu Gly Val Thr Gly Ile Gly Met Val Val Leu Met Thr Ile 485 490 495	1488
gcc ttt aca ttg gct aca aca tgg ttc aga cgt aat aag ctc aac ctt Ala Phe Thr Leu Ala Thr Thr Trp Phe Arg Arg Asn Lys Leu Asn Leu 500 505 510	1536
cct gga cca ctg aag aaa ata aca ggc ttc aat gcc ttc tgg tac tct Pro Gly Pro Leu Lys Lys Ile Thr Gly Phe Asn Ala Phe Trp Tyr Ser 515 520 525	1584
cac cac tta ttt gtt atc gtc tac tcg ctt ctt gtc gtt cat gga ttc His His Leu Phe Val Ile Val Tyr Ser Leu Leu Val Val His Gly Phe 530 535 540	1632
tac gta tac ctc atc atc gag cca tgg tac aag aaa acg aca tgg atg Tyr Val Tyr Leu Ile Ile Glu Pro Trp Tyr Lys Lys Thr Thr Trp Met 545 550 555 560	1680
tat ttg atg gta ccg gtg gtt ctt tac ttg tgt gaa agg ctg att cgt Tyr Leu Met Val Pro Val Val Leu Tyr Leu Cys Glu Arg Leu Ile Arg 565 570 575	1728
gca ttc agg tca agc gtc gag gct gtt tca gtg cta aag gtt gct gtg Ala Phe Arg Ser Ser Val Glu Ala Val Ser Val Leu Lys Val Ala Val 580 585 590	1776
tta cca ggg aat gtc ttg tcg ctt cac ttg tca aga cca agc aac ttc Leu Pro Gly Asn Val Leu Ser Leu His Leu Ser Arg Pro Ser Asn Phe 595 600 605	1824
aga tac aag agt gga caa tac atg tat ctc aac tgt tct gca gtt tct Arg Tyr Lys Ser Gly Gln Tyr Met Tyr Leu Asn Cys Ser Ala Val Ser 610 615 620	1872
aca tta gaa tgg cat cca ttc tca att acc tca gct cca gga gat gac Thr Leu Glu Trp His Pro Phe Ser Ile Thr Ser Ala Pro Gly Asp Asp 625 630 635 640	1920
tac ctc agt gtc cac atc agg gtt tta gga gac tgg act aag caa tta Tyr Leu Ser Val His Ile Arg Val Leu Gly Asp Trp Thr Lys Gln Leu 645 650 655	1968
aga tca tta ttc tct gag gtg tgc aag cca cgc cct cct gat gaa cac Arg Ser Leu Phe Ser Glu Val Cys Lys Pro Arg Pro Asp Glu His 660 665 670	2016
aga ctg aac aga gcc gac tcg aag cac tgg gat tac atc cct gac ttt Arg Leu Asn Arg Ala Asp Ser Lys His Trp Asp Tyr Ile Pro Asp Phe 675 680 685	2064
cca aga atc cta att gat ggt cca tat gga gca cca gca caa gac tac Pro Arg Ile Leu Ile Asp Gly Pro Tyr Gly Ala Pro Ala Gln Asp Tyr 690 695 700	2112
aag aag ttt gaa gtt gtt ctg cta gtg ggt cta gga atc ggt gcc act Lys Lys Phe Glu Val Val Leu Leu Val Gly Leu Gly Ile Gly Ala Thr 705 710 715 720	2160
ccg atg atc agc ata gtg agt gac ata atc aat aac ttg aaa ggc gtg Pro Met Ile Ser Ile Val Ser Asp Ile Ile Asn Asn Leu Lys Gly Val 725 730 735	2208
gaa gaa ggc agt aac cga aga cag tca ccg atc cat aat atg gtc aca Glu Glu Gly Ser Asn Arg Arg Gln Ser Pro Ile His Asn Met Val Thr 740 745 750	2256

Sequence Listing

cct cct gtt tct cca tca aga aaa agt gag acg ttc aga acc aag aga Pro Pro Val Ser Pro Ser Arg Lys Ser Glu Thr Phe Arg Thr Lys Arg 755 760 765	2304
gct tac ttc tac tgg gtc aca aga gag cag ggg tcg ttt gac tgg ttc Ala Tyr Phe Tyr Trp Val Thr Arg Glu Gln Gly Ser Phe Asp Trp Phe 770 775 780	2352
aag aac gtg atg gac gaa gtg act gaa aca gac cgc aaa aac gta att Lys Asn Val Met Asp Glu Val Thr Glu Thr Asp Arg Lys Asn Val Ile 785 790 795 800	2400
gag ctg cat aat tac tgc acc agc gtt tac gag gaa ggg gac gcg agg Glu Leu His Asn Tyr Cys Thr Ser Val Tyr Glu Glu Gly Asp Ala Arg 805 810 815	2448
tct gca ctt atc acg atg ctc cag tct cta aac cat gct aag cat gga Ser Ala Leu Ile Thr Met Leu Gln Ser Leu Asn His Ala Lys His Gly 820 825 830	2496
gtg gac gtt gtg tca gga aca cgt gtc atg tcc cat ttc gct agg cca Val Asp Val Val Ser Gly Thr Arg Val Met Ser His Phe Ala Arg Pro 835 840 845	2544
aac tgg aga agc gtt ttc aaa agg atc gct gtg aat cat cct aag act Asn Trp Arg Ser Val Phe Lys Arg Ile Ala Val Asn His Pro Lys Thr 850 855 860	2592
aga gtc gga gtg ttt tat tgt gga gca gct ggg tta gtg aaa gag tta Arg Val Gly Val Phe Tyr Cys Gly Ala Ala Gly Leu Val Lys Glu Leu 865 870 875 880	2640
cga cac tta tca ctg gat ttc tct cat aag acc tcc acc aag ttc atc Arg His Leu Ser Leu Asp Phe Ser His Lys Thr Ser Thr Lys Phe Ile 885 890 895	2688
ttc cat aaa gag aat ttc taa Phe His Lys Glu Asn Phe 900	2709

<210> 22

<211> 902

<212> PRT

<213> *Arabidopsis thaliana*

<400> 22

Met Met Asn Arg Ser Glu Met Gln Lys Leu Gly Phe Glu His Val Arg 1 5 10 15
Tyr Tyr Thr Glu Ser Pro Tyr Asn Arg Gly Glu Ser Ser Ala Asn Val 20 25 30
Ala Thr Thr Ser Asn Tyr Tyr Gly Glu Asp Glu Pro Tyr Val Glu Ile 35 40 45
Thr Leu Asp Ile His Asp Asp Ser Val Ser Val Tyr Gly Leu Lys Ser 50 55 60
Pro Asn His Arg Gly Ala Gly Ser Asn Tyr Glu Asp Gln Ser Leu Leu 65 70 75 80
Arg Gln Gly Arg Ser Gly Arg Ser Asn Ser Val Leu Lys Arg Leu Ala 85 90 95
Ser Ser Val Ser Thr Gly Ile Thr Arg Val Ala Ser Ser Val Ser Ser 100 105 110
Ser Ser Ala Arg Lys Pro Pro Arg Pro Gln Leu Ala Lys Leu Arg Arg 115 120 125
Ser Lys Ser Arg Ala Glu Leu Ala Leu Lys Gly Leu Lys Phe Ile Thr 130 135 140
Lys Thr Asp Gly Val Thr Gly Trp Pro Glu Val Glu Lys Arg Phe Tyr 145 150 155 160
Val Met Thr Met Thr Asn Asn Gly Leu Leu His Arg Ser Arg Phe Gly 165 170 175
Glu Cys Ile Gly Met Lys Ser Thr Glu Phe Ala Leu Ala Leu Phe Asp 180 185 190
Ala Leu Ala Arg Arg Glu Asn Val Ser Gly Asp Ser Ile Asn Met Asn 195 200 205
Glu Leu Lys Glu Phe Trp Lys Gln Ile Thr Asp Gln Asp Phe Asp Ser 210 215 220

Sequence Listing

Arg Leu Arg Thr Phe Phe Ala Met Val Asp Lys Asp Ser Asp Gly Arg
 225 230 235 240
 Leu Asn Glu Ala Glu Val Arg Glu Ile Ile Thr Leu Ser Ala Ser Ala
 245 250 255
 Asn Glu Leu Asp Asn Ile Arg Arg Gln Ala Asp Glu Tyr Ala Ala Leu
 260 265 270
 Ile Met Glu Glu Leu Asp Pro Tyr His Tyr Gly Tyr Ile Met Ile Glu
 275 280 285
 Asn Leu Glu Ile Leu Leu Leu Gln Ala Pro Met Gln Asp Val Arg Asp
 290 295 300
 Gly Glu Ser Lys Lys Leu Ser Lys Met Leu Ser Gln Asn Leu Met Val
 305 310 315 320
 Pro Gln Ser Arg Asn Leu Gly Ala Arg Phe Cys Arg Gly Met Lys Tyr
 325 330 335
 Phe Leu Phe Asp Asn Trp Lys Arg Val Trp Val Met Ala Leu Trp Ile
 340 345 350
 Gly Ala Met Ala Gly Leu Phe Thr Trp Lys Phe Met Glu Tyr Arg Lys
 355 360 365
 Arg Ser Ala Tyr Glu Val Met Gly Val Cys Val Cys Ile Ala Lys Gly
 370 375 380
 Ala Ala Glu Thr Leu Lys Leu Asn Met Ala Met Ile Leu Leu Pro Val
 385 390 395 400
 Cys Arg Asn Thr Ile Thr Trp Leu Arg Thr Lys Thr Lys Leu Ser Ala
 405 410 415
 Ile Val Pro Phe Asp Asp Ser Leu Asn Phe His Lys Val Ile Ala Ile
 420 425 430
 Gly Ile Ser Val Gly Val Gly Ile His Ala Thr Ser His Leu Ala Cys
 435 440 445
 Asp Phe Pro Arg Leu Ile Ala Ala Asp Glu Asp Gln Tyr Glu Pro Met
 450 455 460
 Glu Lys Tyr Phe Gly Pro Gln Thr Lys Arg Tyr Leu Asp Phe Val Gln
 465 470 475 480
 Ser Val Glu Gly Val Thr Gly Ile Gly Met Val Val Leu Met Thr Ile
 485 490 495
 Ala Phe Thr Leu Ala Thr Thr Trp Phe Arg Arg Asn Lys Leu Asn Leu
 500 505 510
 Pro Gly Pro Leu Lys Lys Ile Thr Gly Phe Asn Ala Phe Trp Tyr Ser
 515 520 525
 His His Leu Phe Val Ile Val Tyr Ser Leu Leu Val Val His Gly Phe
 530 535 540
 Tyr Val Tyr Leu Ile Ile Glu Pro Trp Tyr Lys Thr Thr Trp Met
 545 550 555 560
 Tyr Leu Met Val Pro Val Val Leu Tyr Leu Cys Glu Arg Leu Ile Arg
 565 570 575
 Ala Phe Arg Ser Ser Val Glu Ala Val Ser Val Leu Lys Val Ala Val
 580 585 590
 Leu Pro Gly Asn Val Leu Ser Leu His Leu Ser Arg Pro Ser Asn Phe
 595 600 605
 Arg Tyr Lys Ser Gly Gln Tyr Met Tyr Leu Asn Cys Ser Ala Val Ser
 610 615 620
 Thr Leu Glu Trp His Pro Phe Ser Ile Thr Ser Ala Pro Gly Asp Asp
 625 630 635 640
 Tyr Leu Ser Val His Ile Arg Val Leu Gly Asp Trp Thr Lys Gln Leu
 645 650 655
 Arg Ser Leu Phe Ser Glu Val Cys Lys Pro Arg Pro Pro Asp Glu His
 660 665 670
 Arg Leu Asn Arg Ala Asp Ser Lys His Trp Asp Tyr Ile Pro Asp Phe
 675 680 685
 Pro Arg Ile Leu Ile Asp Gly Pro Tyr Gly Ala Pro Ala Gln Asp Tyr
 690 695 700
 Lys Lys Phe Glu Val Val Leu Leu Val Gly Leu Gly Ile Gly Ala Thr
 705 710 715 720
 Pro Met Ile Ser Ile Val Ser Asp Ile Ile Asn Asn Leu Lys Gly Val

Sequence Listing

Glu	Glu	Gly	Ser	Asn	Arg	Arg	Gln	Ser	Pro	Ile	His	Asn	Met	Val	Thr
725	730	735	740	745	750	755	760	765	770	775	780	785	790	795	800
Pro	Pro	Val	Ser	Pro	Ser	Arg	Lys	Ser	Glu	Thr	Phe	Arg	Thr	Lys	Arg
755	760	765	770	775	780	785	790	795	800	805	810	815	820	825	830
Ala	Tyr	Phe	Tyr	Trp	Val	Thr	Arg	Glu	Gln	Gly	Ser	Phe	Asp	Trp	Phe
835	840	845	850	855	860	865	870	875	880	885	890	895	900		
Lys	Asn	Val	Met	Asp	Glu	Val	Thr	Glu	Thr	Asp	Arg	Lys	Asn	Val	Ile
Glu	Leu	His	Asn	Tyr	Cys	Thr	Ser	Val	Tyr	Glu	Glu	Gly	Asp	Ala	Arg
Ser	Ala	Leu	Ile	Thr	Met	Leu	Gln	Ser	Leu	Asn	His	Ala	Lys	His	Gly
Val	Asp	Val	Val	Ser	Gly	Thr	Arg	Val	Met	Ser	His	Phe	Ala	Arg	Pro
Asn	Trp	Arg	Ser	Val	Phe	Lys	Arg	Ile	Ala	val	Asn	His	Pro	Lys	Thr
Arg	Val	Gly	Val	Phe	Tyr	Cys	Gly	Ala	Ala	Gly	Leu	Val	Lys	Glu	Leu
Arg	His	Leu	Ser	Leu	Asp	Phe	Ser	His	Lys	Thr	Ser	Thr	Lys	Phe	Ile
Phe	His	Lys	Glu	Asn	Phe										

<210> 23
<211> 20
<212> DNA
<213> Artificial sequence

<220>
<223> Description of the artificial sequence:
oligonucleotide primer

<400> 23
garcaaggct ctttgattg

20

<210> 24
<211> 21
<212> DNA
<213> Artificial sequence

<220>
<223> Description of the artificial sequence:
oligonucleotide primer

<400> 24
gaaatgctcc ttatgaaatt c

21